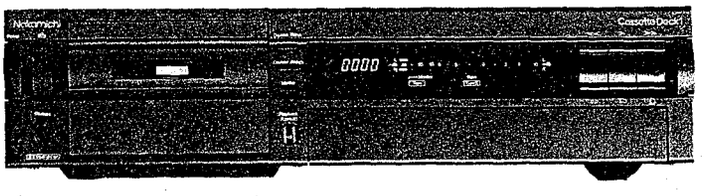
Service Manual

Nakamichi

Cassette Deck 1



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1. GENERAL

1.1. Production No.

Production No.: A133

1.2. Destinations

USA, CAN, EP, UK, AUS, OTR, SAU, JPN

Abbreviation

USA — U.S.A.	AUS — Australia
CAN — Canada	OTR — Other
EP — Europe	SAU — Saudi Arabia
UK — United Kingdom	JPN — Japan

1.3. Parts Supply

(1) Unstocked Parts

Parts marked with "★" at the head of part No. are not stocked. So, it takes time to supply the parts after we receive your order.

(2) Unsupplied Parts

Parts without part Nos. (indicated as "—" in the parts list) are not supplied.

1.4. CAUTIONS/WARNINGS

(1) Product Safety Notice

Parts marked with the symbol ⚠ in the schematic diagram have critical characteristics.

Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

1.6. Package Ass'y and Accessory Ass'y

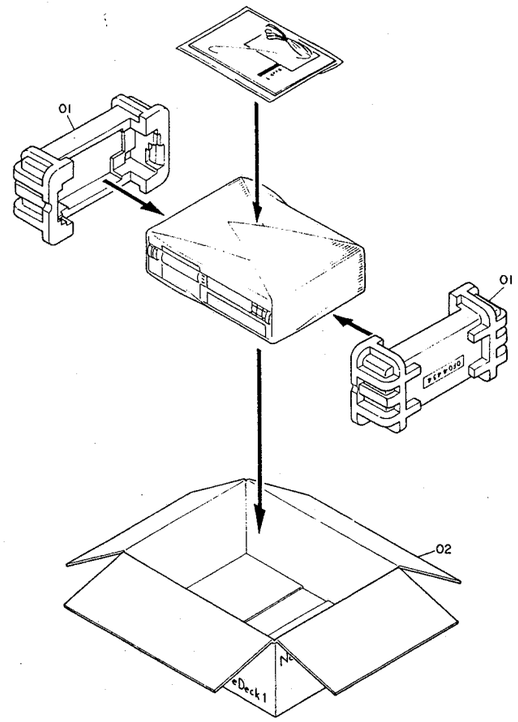


Fig. 1

Schematic Ref. No.	Part No.	Description	Q'ty
	—	Package Ass'y	
01	0F04483A	Packing	2
02	0F04457A	Carton Box	1
	DA04402A	Accessory Ass'y (USA, CAN)	1
	DA04407A	Accessory Ass'y (UK)	1
	DA04404A	Accessory Ass'y (EP)	1
	DA04403A	Accessory Ass'y (AUS, OTR, SAU)	1
	DA04401A	Accessory Ass'y (JPN)	1
	0D06122A	Onwer's Manual (Japanese)	1
	0D06123A	Onwer's Manual (English/French/ Germany)	1
	DA04439A	Pin-Pin Cord Ass'y	1

(2) Leakage Current Check/Resistance Check

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.

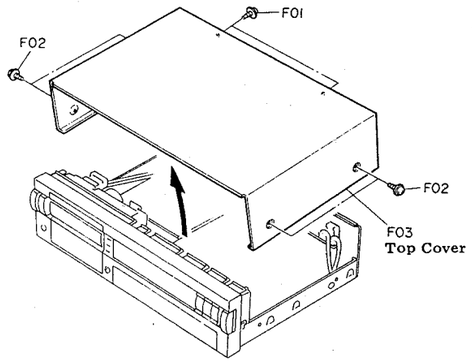
WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

1.5. Voltage Selector

Voltage selector is installed on the Rear Panel of the Nakamichi Cassette Deck 1 (Other & Saudi Arabia). The voltage seldctor can select either 110V/127V or 220V/240V at customer's disposal.

2. REMOVAL PROCEDURES

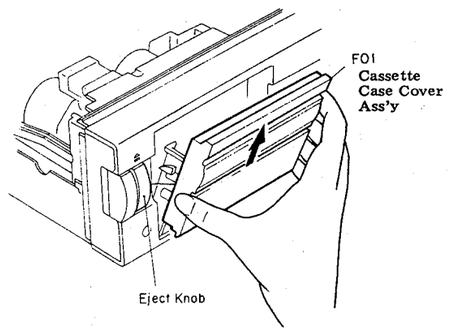
2.1. Top Cover
Refer to Fig. 2.1.
(1) Loosen screws F01 (2 pcs.) and F02 (4 pcs.), and remove F03 (Top Cover).



Front View

Fig. 2.1

2.2. Cassette Case Cover Ass'y
Refer to Fig. 2.2.
(1) Press the Eject button to open F01 (Cassette Case Cover Ass'y).
(2) Pull F01 (Cassette Case Cover Ass'y) upward.



Front View

Fig. 2.2

2.3. Sealing Panel Ass'y
Refer to Fig. 2.3.
(1) Open F01 (Sealing Panel Ass'y).
(2) Hold by hand and pull F01 (Sealing Panel Ass'y) in the direction of the arrow.

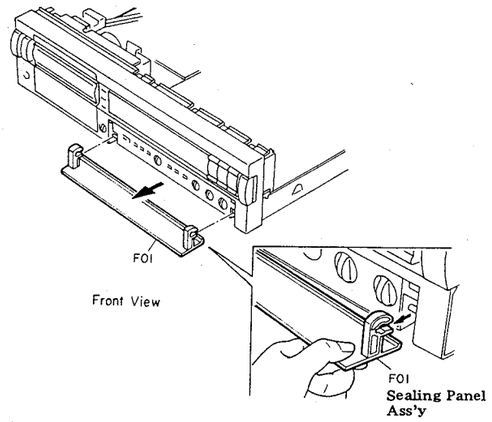
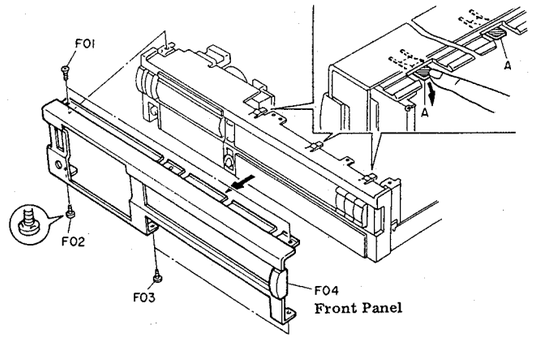


Fig. 2.3

2.4. Front Panel
Refer to Fig. 2.4.
(1) Remove the Top Cover referring to item 2.1.
(2) Loosen screws F01 (2 pcs.), F02 (1 pce.) and F03 (2 pcs.).
(3) With pressing claws A (3 pcs.), remove F04 (Front Panel).

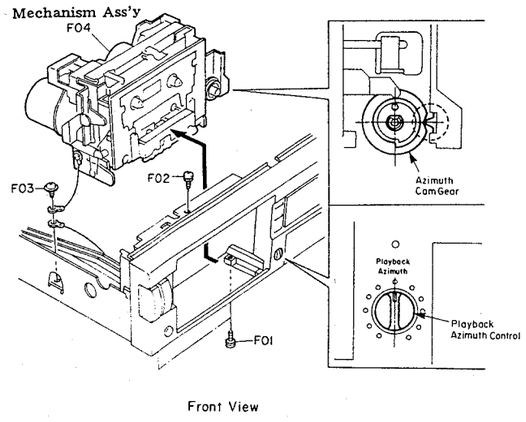


Front View

Fig. 2.4

2.5. Mechanism Ass'y
Refer to Fig. 2.5.
(1) Remove the Top Cover and Cassette Case Cover Ass'y referring to item 2.1 and 2.2.
(2) Loosen screws F01 (2 pcs.), F02 (1 pce.) and F03.
(3) Remove F04 (Mechanism Ass'y) in the direction of the arrow.

Note: When installing the Mechanism Ass'y, perform the following:
(1) Turn the Azimuth Cam Gear by hand so that it is set as shown in the figure.
(In this position, playback head azimuth is set to zero.)
(2) Set the Playback Azimuth control on the Front Panel to the center position.
(3) Install the Mechanism Ass'y by reversing the above procedure.

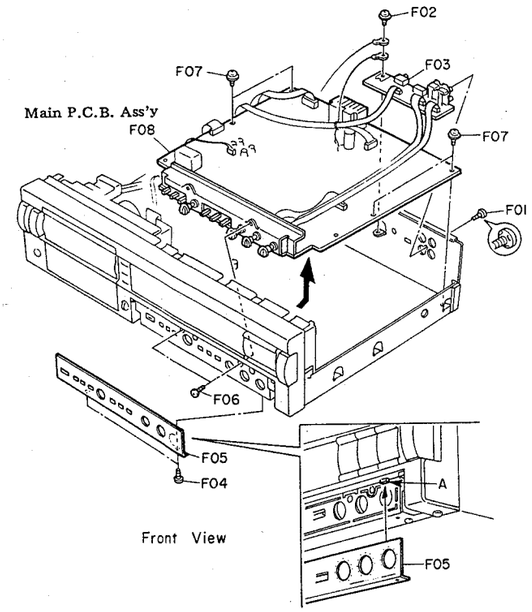


Front View

Fig. 2.5

2.6. Main P.C.B. Ass'y
Refer to Fig. 2.6.
(1) Remove the Top Cover and Sealing Panel Ass'y referring to items 2.1 and 2.3.
(2) Loosen screws F01 (1 pce.) and F02 (1 pce.), and remove F03 (Pin Jack P.C.B. Ass'y).
(3) Loosen screws F04 (2 pcs.) and remove F05 (Inner Panel).
(4) Loosen screws F06 (2 pcs.) and F07 (4 pcs.), and remove F08 (Main P.C.B. Ass'y) in the direction of the arrow.

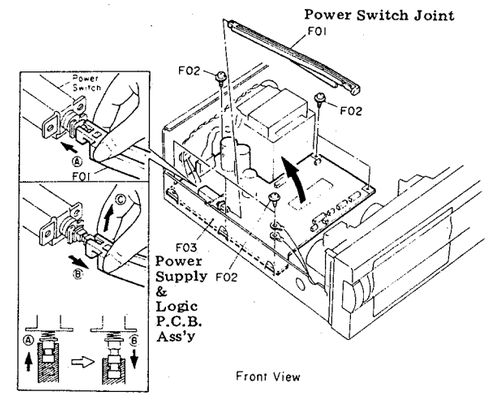
Note: When installing F05 (Innter Panel), insert protrusions A (3 pcs.) into the claws of F05 (Inner Panel) and fasten F05 (Inner Panel) with screws F04 (2 pcs.).



Front View

Fig. 2.6

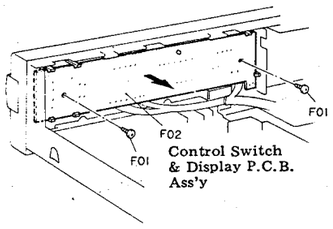
2.7. Power Switch Joint and Power Supply and Logic P.C.B. Ass'y
Refer to Fig. 2.7.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Push F01 (Power Switch Joint) backward (in the direction of (A)).
(3) Pull F01 (Power Switch Joint) forward (in the direction of (B)).
(4) Pull F01 (Power Switch Joint) upward (in the direction of (c)) to remove it.
(5) Loosen screws F02 (6 pcs.) and remove F03 (Power Supply and Logic P.C.B. Ass'y) in the direction of the arrow.



Front View

Fig. 2.7

2.8. Control Switch & Display P.C.B. Ass'y
Refer to Fig. 2.8.
(1) Remove the Mechanism Ass'y referring to item 2.5 to gain access to the fastening screw.
(2) Loosen screws F01 (2 pcs.), unhook the claws (6 pcs.), and remove F02 (Control Switch & Display P.C.B. Ass'y).



Rear View

Fig. 2.8

2.9. Head Mount Base Ass'y

Refer to Fig. 2.9.1.

(1) Remove the Mechanism Ass'y referring to item 2.5.
(2) Loosen screws F01 (2 pcs.) and remove F02 (Head Mount Cover).
(3) Loosen screws F03 (2 pcs.) and remove F04 (Head Mount Base Ass'y).

Note: When installing the Head Mount Base Ass'y, follow the next steps. Refer to Figs. 2.9.2 and 2.9.3.
  (a) Insert the Plate Washers into the grooves of the shafts by hand. See Fig. 2.9.2.
  (b) Install F04 (Head Mount Base Ass'y) and fasten F03 (2 pcs.). Push the Plate Washers with a blade of the screwdriver so that the Plate Washers come off the grooves. See Fig. 2.9.3.

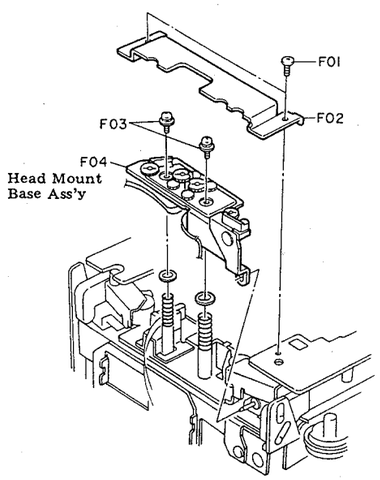


Fig. 2.9.1

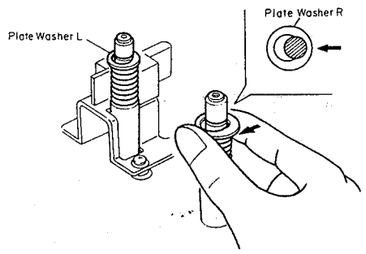


Fig. 2.9.2

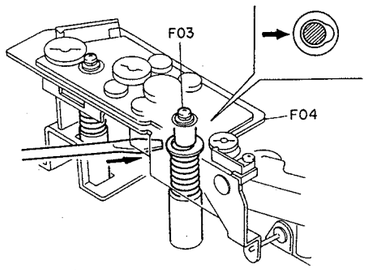


Fig. 2.9.3

3. TEST TAPES AND GAUGES

(1) 400 Hz Level Tape (DA09005B)
(2) 1 kHz Track Alignment B Tape (DA09007B)
(3) 10 kHz PB Frequency Response Tape (DA09003B)
(4) 15 kHz PB Frequency Response Tape (DA09002B)
(5) 20 kHz PB Frequency Response Tape (DA09001B)
(6) 15 kHz Azimuth Tape (DA09004B)
(7) 3 kHz Speed and Wow/Flutter Tape (DA09006C)
(8) Tape Travelling Cassette (DA09071A)
(9) Reference EXII Tape (DA09111A)
(10) Reference SX Tape (DA09110A)
(11) Reference ZX Tape (DA09109A)
(12) EH Tilt Check Gauge S (DA09088A)
(13) Stroke Check Gauge S (DA09090A)
(14) Tape Guide Height Check Gauge S (DA09091A)
(15) Tilt Check Gauge S (DA09039B)
(16) Torque Gauge FWD (DA09082A)
(17) Playback Azimuth Centering Pin (0D09066A)

4. MECHANICAL ADJUSTMENTS

4.1. Record Head and Playback Head Tilt Adjustment

Note: Before adjusting items 4.1 to 4.5, pull out the Cassette Case Cover Ass'y referring to item 2.2 and remove the Head Mount Cover by loosening two screws.

Refer to Fig. 4.1.

(1) Remove the pad lifter from the playback head.
(2) Load a Tilt Check Gauge S (DA09039B) in the cassette deck.
(3) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the chassis of the cassette deck with the other end.
(4) Remove both of the Height Gears.
(5) Set the cassette deck in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to away from the heads, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
(6) Beacon Playback Head "Lower" will light on when height adjustment screw (PH) turned counterclockwise but playback Head "Upper" when clockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob away from the heads and then return it to the original place.
(7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (RH).
(8) Set the cassette deck in Stop mode and fit both of the serrated Height Gears. Then set the cassette deck again in Play mode and insure all of the 4 Beacons are illuminating. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
(9) Mount the pad lifter on the playback head.

4.2. Head Base Stroke Check

Remove the Cover Plate Ass'y.

Refer to Fig. 4.2.

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge S" to insure freedom from tilt on the playback head and record head.

(1) Load a Stroke Check Gauge S (DA09090A) in the cassette deck.
(2) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the cassette deck in Play mode.
Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.
(3) Check to insure whether the line "P" on the Playback Head Indicator meets the central line on the Indicator Plate.
(4) Check to insure whether the line "P" on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

4.3. Erase Head Stroke Adjustment and Tape Guide Height Check

Remove the Cover Plate Ass'y and the Head Mount Base Ass'y.

Refer to Fig. 4.3.

(1) Erase Head Stroke Adjustment
(a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
(b) Set the cassette deck in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.
(c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening screw A that assembles erase head with erase head plate.
(d) After completion of adjustment, screw A shall be locked with lock tight paint.

(2) Supply Tape Guide Height Adjustment
(a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
(b) Set the cassette deck in Play mode.
(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, and check to insure that the Supply Tape Guide Check Bar is accepted by the supply tape guide. If not, adjust the supply tape guide height by turning screw B.

(3) Take-up Tape Guide Height Check
(a) Load a Tape Guide Height Check Gauge S (DA09091A) in the cassette deck.
(b) Set the cassette deck in Play mode.
(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, and check to insure that the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

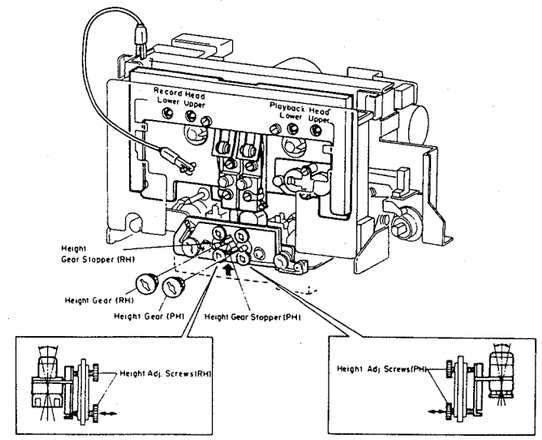


Fig. 4.1

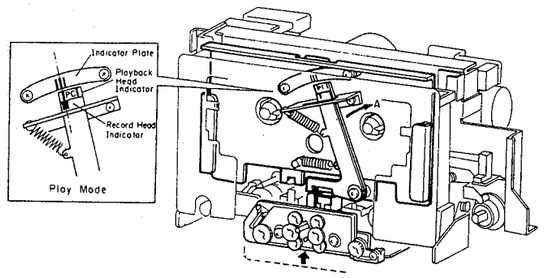


Fig. 4.2

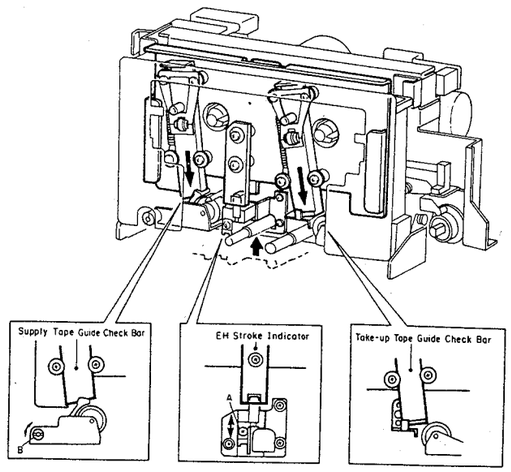


Fig. 4.3

4.4. Erase Head Height and Tilt Adjustment

Refer to Fig. 4.4.

(1) Remove the Cassette Case Cover Ass'y, Cover Plate Ass'y, and Head Mount Base Ass'y.
(2) Load an EH Tilt Check Gauge S (DA09088A) in the cassette deck.
(3) Set the cassette deck in Stop mode.
(4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether the first Beacon is illuminating.
(5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on the second Beacon. Excessive turning will cause the first Beacon to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the first and the second Beacons illuminate.
(6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on the third Beacon. Excessive turning will cause either the first or the second Beacon to light off, and therefore adjust Screw "Azimuth" until all of the 3 Beacons illuminate.
(7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

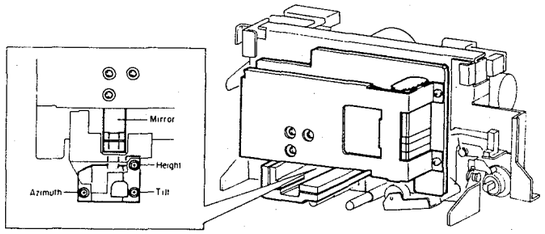


Fig. 4.4

4.5. Playback Head and Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.5.1 and 4.5.2.

(1) Playback Head Height Adjustment and Azimuth Alignment

Note: The Cassette Deck 1 is equipped with the playback azimuth control which can change the playback azimuth manually. So, before adjusting the playback head, perform the following to fix the playback head azimuth to the mechanical center.

1. Set the Playback Azimuth control on the Front Panel to the center position. (See Fig. 4.5.1.)
2. Insert the Playback Azimuth Centering Pin (0D09066A) securely as shown in Fig. 4.5.1.

(a) Press the Monitor button to select TAPE indication.
(b) Connect an AC voltmeter to the Output Jacks.
(c) Load a 1 kHz Track Alignment B Tape (DA09007B) and set the cassette deck in Play mode.
(d) Turn the PH Height Gear until the outputs of both channels become minimum.
(e) Load a 15 kHz Azimuth Tape (DA09004B) and set the cassette deck in Play mode.
(f) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.
(g) Repeat above steps (c) through (f) two or three times to obtain optimum performance.

(2) Record Head Height Adjustment and Azimuth Alignment

(a) Connect an AC voltmeter to Output Jacks.
(b) Press the Monitor button to select TAPE indication.
(c) Press the Type IV button.
(d) Load a reference ZX tape.
(e) Feed in 400 Hz (0 dB) to the Input Jacks.
(f) Set the cassette deck in Record and Play mode and turn the RH Height Gear until the outputs of both channels become maximum.
(g) Feed in 15 kHz (—20 dB) to the Input Jacks and turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.
(h) Repeat (e) to (g) two or three times to obtain optimum performance.
(i) Set the cassette deck in Stop mode and remove the Playback Azimuth Centering Pin.

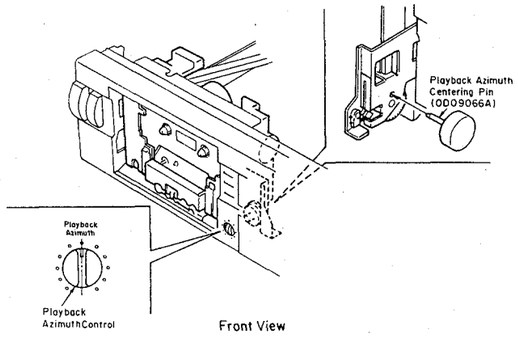


Fig. 4.5.1

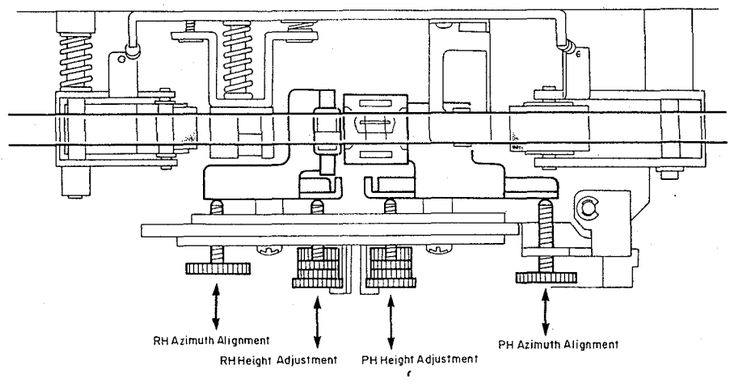


Fig. 4.5.2

4.6. Tape Travelling Check

Load and play back a Tape Travelling Cassette and check the following:

(1) Tape is in contact with heads sufficiently.
(2) Tape waving is small on the heads and pressure rollers.
(3) Tape is free from waving or slippage from the tape guides.

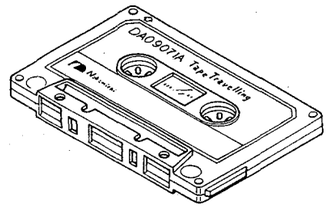


Fig. 4.6

4.7. Eject Damper Adjustment

Refer to Fig. 4.7. Load a cassette tape, and with opening the Cassette Case by pressing the Eject button and closing it by hand, adjust the speed of damper action by the Adjustment Screw.

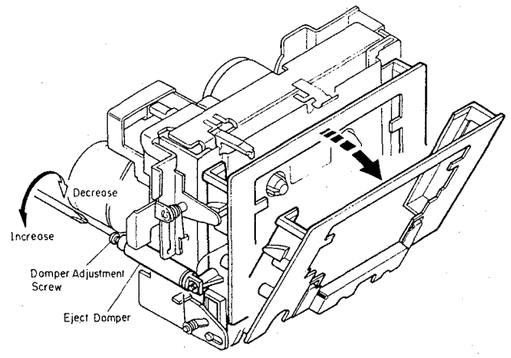


Fig. 4.7

4.8. Reel Motor Speed Adjustment in Play Mode

(1) To warm-up the cassette deck, load a C-60 cassette tape and set the cassette deck in Play mode.
(2) After more than four minutes, load a Torque Gauge FWD (DA09082A) and set the cassette deck in Play mode.
(3) Adjust VR501 on the Power Supply & Logic P.C.B. Ass'y to obtain 47 ±1 g-cm on the torque gauge.

4.9. Tape Speed Adjustment

Refer to Fig. 4.8.

(1) Connect a frequency counter to the Output Jacks.
(2) Load a 3 kHz Speed and Wow/Flutter Tape (DA09006C) and play it back.
(3) Adjust the Tape Speed Adjustment Volume incorporated in the Capstan Motor to obtain 3,000 Hz on the frequency counter.
    CCW: Motor drives slowly.
    CW: Motor drives fast.

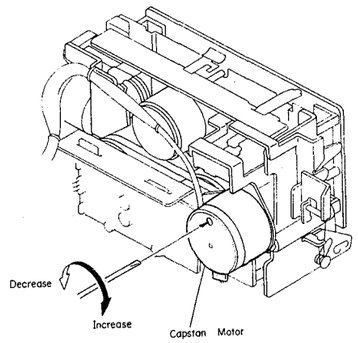


Fig. 4.8

4.10. Lubrication

The tape transport is of a lubrication-free type mechanism. When the following parts are replaced, apply the specified lubricant.

(1) Molykote (R) Grease (X5-6020)
    Cam Motor Pulley
    Thrust portion on the Capstan Shaft
(2) FLOIL GB-TS-1
    Washer between Reel Hub Ass'y and Back Tension Spring
(3) Diamond Oil (EP-56)
    Reel Hub Shaft
(4) Anderol 456
    Capstan Shaft

Note: We suggest that you use the above specified lubricant or equivalent type.
The company dealing in the above lubricant is as follows:

(a) Molykote (R) Grease (X5-6020)
Dowcorning Co., Ltd., 1-15-1 Nishishinbashi, Minato-ku, Tokyo, Japan
(b) FLOIL GB-TS-1
Kanto Chemicals Co., Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-ku, Tokyo, Japan
(c) Diamond Oil (EP-56)
Mitsubishi Oil Co., Ltd., 1-2-4 Toranomon, Minato-ku, Tokyo, Japan
(d) Anderol 456
Toyo Kokusai Oil Co., Ltd., 3-3-5 Hatchobori, Chuo-ku, Tokyo, Japan

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

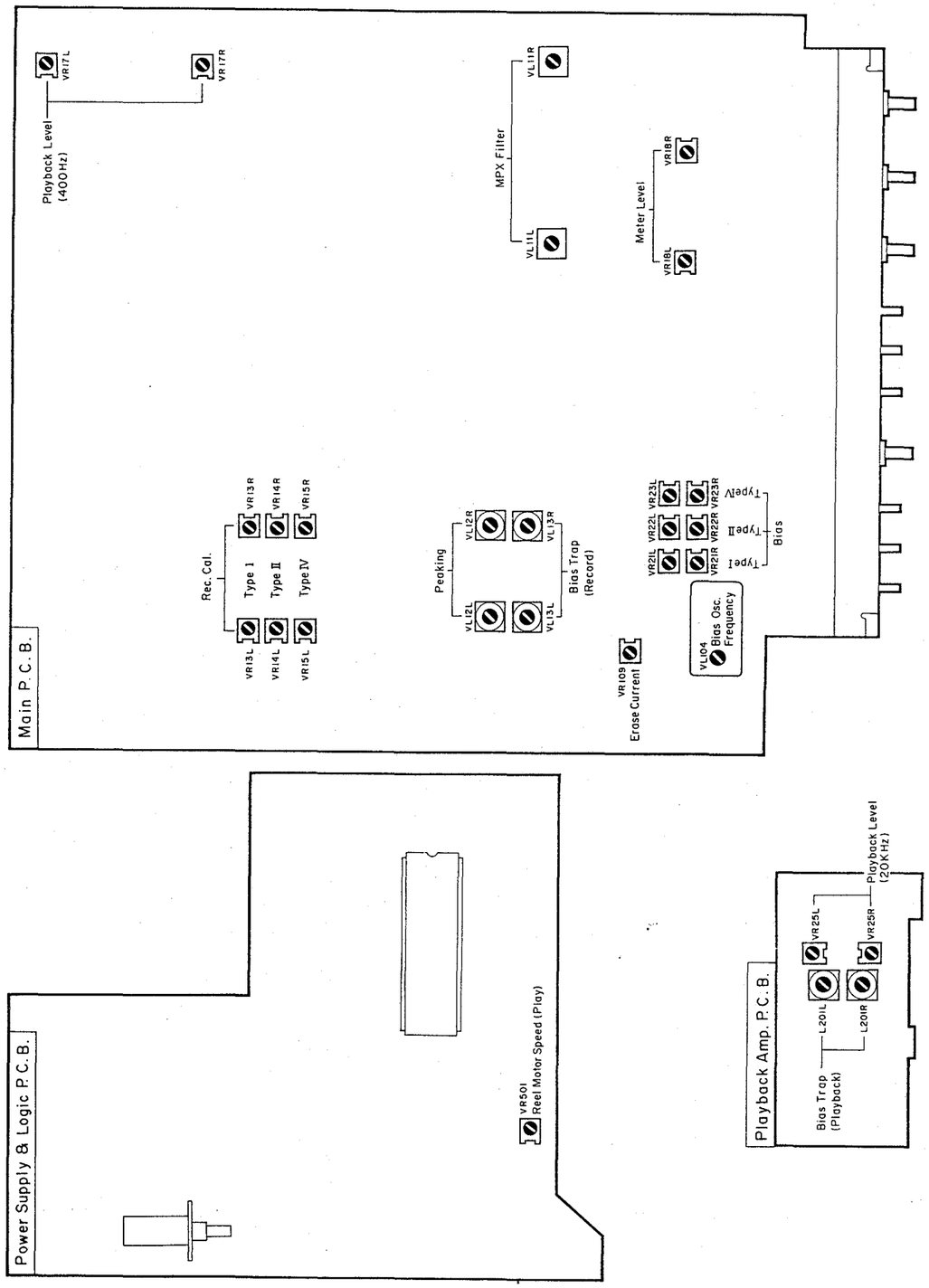
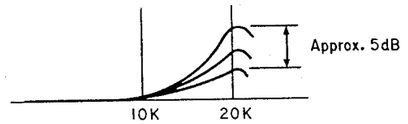


Fig. 5

6. ELECTRICAL ADJUSTMENTS

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
1	Preliminary Step			**Output Level - Max.** Balance - Center **Bias Tune - Center** Monitor - Tape Tape - IV MPX Filter - OFF Dolby NR - OFF		Set the Cassette Deck 1 as shown in MODE.
2	Reel Motor Speed Adjustment (Play)	Torque Guage FWD (DA09082A)		Playback	Power Supply & Logic P.C.B. VR501	Adjust VR501 to obtain 47 ±1 g-cm on the torque gauge.
3	Tape Speed Adjustment	3 kHz Speed and Wow/ Flutter Tape (DA09006C)	Frequency Counter to Output Jacks	Playback Monitor - Tape Tape - I	Tape Speed Adj. Volume (Capstan Motor)	Adjust the volume incorporated in the Capstan Motor Ass'y to obtain 3 kHz ± 15 Hz on the frequency counter.
4	Meter Level Calibration	400 Hz to Input Jacks	AC Volt-meter to Output Jacks	Monitor - Source	Main P.C.B. VR18L VR18R	1. Feed in 400 Hz and adjust the Record Level control to obtain 500 mV -2 dB on the AC voltmeter. 2. Adjust VR18L (VR18R) so that the 0 dB segment on the level meter starts illuminating.
5	MPX Filter Adjustment	19 kHz ±100 Hz to Input Jacks	AC Volt-meter to Output Jacks	Monitor - Source MPX - OFF/ON	Main P.C.B. VL11L VL11R	1. Adjust the Input Level control to obtain 500 mV (0 dB) on the AC voltmeter. 2. Set the MPX Filter switch to ON and adjust VL11L (VL11R) to obtain minimum reading on the AC voltmeter. (The minimum reading will be less than -30 dB.)
6	Playback Head Track Alignment	1 kHz Track Alignment B Tape (DA09007B)	AC Volt-meter to Output Jacks	Playback Monitor - Tape Tape - IV Dolby NR - OFF	PH Height Gear	Adjust the PH Height Gear to obtain the minimum readings on the AC voltmeter for both channels. Refer to "Playback Head Height Adjustment" in item 4.5. (Azimuth Centering Pin (OD09066A) must be set before adjusting.)
7	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004B)	AC Volt-meter to Output Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum readings on the AC voltmeter for both channels. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 3.5. (Azimuth Centering Pin (OD09066A) must be set before adjusting.) Note: Repeat Steps 6 and 7 two or three times to obtain optimum performance.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARK
8	Playback Level Calibration	400Hz Level Tape (DA09005B)	AC Volt-meter to Output Jacks	Playback Monitor - Tape Tape - IV Dolby NR - OFF	Main P.C.B. VR17L VR17R	Adjust VR17L (VR17R) to obtain 500 mV on the AC voltmeter.
9	Playback Frequency Response Adjustment	400Hz Level Tape (DA09005B) 10 kHz PB Frequency Response Tape (DA09003B) 15 kHz PB Frequency Response Tape (DA09002B) 20 kHz PB Frequency Response Tape (DA09001B)	AC Volt-meter to Output Jacks	Same as above	Playback Amp. P.C.B. VR25L VR25R	1. Load a 400 Hz level tape, play it back, and read the playback level on the AC voltmeter. 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to obtain maximum levels on the AC voltmeter with each tape. Check that the playback levels are as follows with respect to the level for 400 Hz level tape. 10 kHz: -20 dB -2 dB to +2 dB 15 kHz: -20 dB -2 dB to +3 dB 20 kHz: -20 dB -2 dB to +4 dB If the levels are out of the ranges, play back the 20 kHz PB frequency response tape and adjust VR25L (VR25R) to obtain -20 dB +1.0 dB. VR25L (VR25R) compensates the play-back frequency response at 20 kHz as shown below:  3. Conduct Step 7 "Playback Head Azimuth Alignment".
10	Bias Oscillation Frequency and Erase Current Adjustment	None	AC Volt-meter across the additional 0.1 ohm resistor and Frequency Counter between terminals 1 and 2 of CN-102 (i.e., accross Erase Head) on Main P.C.B.	Record, Playback Monitor - Source Tape - IV Dolby NR - OFF	Main P.C.B. VL104 VR109	1. Connect an additional 0.1 ohm resistor in seies to the Erase Head and connect the AC voltmeter across the resistor. 2. Record and playback a reference ZX tape. 3. Adjust VL104 to obtain 105 kHz on the frequency counter. 4. Check the erase current by the AC voltmeter. Erase current will be within the range of 310 mA to 380 mA (typically approx. 350 mA). If erase current is less than 310 mA, adjust VR109 to obtain satisfactory results. 5. If erase current is adjusted with VR109, re-check the bias oscillation frequency. 6. Remove the additional 0.1 ohm resistor.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
11	Bias Trap Adjustment (Record Amp.)	Remove input signals	AC Volt-meter between emitter of Q111L/R and GND on Main P.C.B.	Record, Playback Monitor - Source Tape - IV Dolby NR - OFF	Main P.C.B. VL13L VL13R	1. Load a cassette without tape inside. 2. Adjust VL13L (VR13R) to obtain minimum reading on the AC voltmeter.
12	Record Head Height Adjustment	400 Hz (0 dB) to Input Jacks	AC Volt-meter to Output Jacks	Record, Playback Monitor - Tape Tape - II Dolby NR - OFF	RH Height Gear	1. Load a reference SX tape, and record and play it back. 2. Adjust the RH Height Gear to obtain maximum readings for both channels on the AC voltmeter. Refer to "Record Head Height Adjust-ment and Azimuth Alignment" in item 4.5.
13	Record Head Azimuth Alignment	15 kHz (-20 dB) to Input Jacks	AC Volt-meter to Output Jacks	Same as above	Record Head Azimuth Alignment Screw	Adjust the Record Head Azimuth Alignment Screw to obtain maximum readings for both channels on the AC voltmeter. Refer to "Record Head Height Adjustment and Azimuth Alignment in item 4.5. Note: Repeat Steps 12 and 13 two or three times to obtain optimum performance.
14	Bias Trap Adjustment (Playback Amp.)	None	AC Volt-meter to Output Jacks	Record, Playback Monitor - Tape Tape - IV Dolby NR - OFF	Playback Amp. P.C.B. L201L L201R	1. Load a cassette without tape inside. 2. Adjust L201L (L201R) to obtain minimum reading on the AC voltmeter.
15	Record Level Calibration and Recording Bias Current Adjustment	400 Hz (0 dB), 20 kHz (-20 dB) and 10 kHz/ 20 kHz (-20 dB) to Input Jacks	AC Volt-meter to Output Jacks	Record, Playback Monitor - Source/ Tape Tape - I/II/IV Dolby NR - OFF/B/C	Main P.C.B. (Level) IV:VR15L VR15R II:VR14L VR14R I:VR13L VR13R (Bias) IV:VR23L VR23R II:VR22L VR22R I:VR21L VR21R	Adjustment should be made in the order of tape type IV, II, and I. 1. Set the Monitor switch to Source and Dolby NR switch to OFF. 2. Feed in 400 Hz, and set the Input Level control to obtain 0 dB (500 mV) on the AC voltmeter. 3. Set the Monitor switch to tape. 4. Load a reference ZX tape, reference SX tape and reference EXII tape. 5. Feed in 400 Hz (0 dB) record and play back, and adjust the following semi-fixed volumes to obtain 0 dB on the AC voltmeter. ZX tape (IV): VR15L, VR15R SX tape (II): VR14L, VR14R EX tape (I) : VR13L, VR13R 6. Set the Dolby NR Switch to C. 7. Feed in 20 kHz (-20 dB) and adjust Bias VR23L (VR23R), VR22L (VR22R) and VR21L (VR21R) to obtain the same readings as source monitor levels on the AC voltmeter. (to be continued)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUST-MENT	REMARKS
						8. Repeat above 6 and 7 two or three times to obtain optimum performance. 9. Feed in 10 kHz and 20 kHz (-20 dB), record and play them back, and check whether the playback levels are within the following ranges. With Dolby NR OFF: -20 dB ±3 dB Level difference between Dolby NR OFF and B: ±2 dB Level difference between Dolby NR OFF and C: ±3 dB 10. Check that the total harmonic distortion is less than 0.8% for ZX and EXII tapes and 1.0% for SX tape. If satisfactory results are not obtained, re-adjust VR21L (VR21R) referring to Step 9 "Playback Frequency Response Adjustment" and repeat above steps.
16	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to Input Jacks	AC Volt-meter to Output Jacks	Record, Playback Monitor - Source/ Tape Tape - I/II/IV Dolby NR - OFF	Main P.C.B. VL12L VL12R	1. Set the Monitor switch to Source. 2. Feed in 400 Hz and adjust the Input Level control to obtain -20 dB on the AC voltmeter. 3. Set the Monitor switch to Tape. 4. Feed in 20 Hz to 20 kHz (-20 dB) and check to insure whether the output levels are within -20 dB ±3 dB. 5. If above is not sufficient, adjust L12L (L12R) to obtain approx. -20 dB at 20 kHz. 6. Conduct step 15 "Record Level Calibration and Recording Bias Current Adjustment". 7. If above is not sufficient, precise re-adjustment of step 9 "Playback Frequency Response", replacement of Playback Head or Record Head, and check on item 4.7 "Tape Travelling Check" will be required.

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

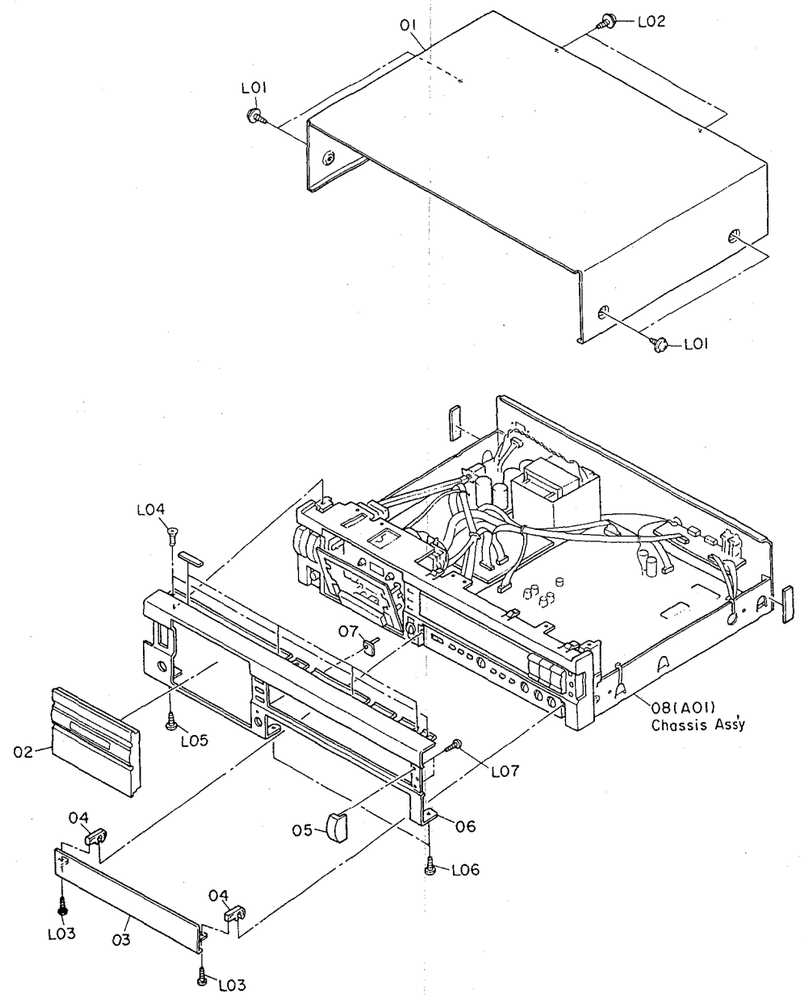


Fig. 7.1

Schematic Ref. No.	Part No.	Description	Q'ty
7.1. Synthesis			
	—	*Synthesis*	
01	0H05710A	Top Cover	1
02	HA05935A	Cassette Case Cover Ass'y	1
03	0H05833A	Sealing Panel	1
04	0J06261B	Sealing Arm	2
05	0H05714A	Dummy Cap	1
06	0H05831A	Front Panel	1
07	0H05845A	Center Lens	1
08	—	Chassis Ass'y	1
L01	0E03032A	BT4x8 ⊕ Pan Washer Faced (Black Chromate)	
L02	0E03632A	BT3x8 ⊕ Binding With Washer (Black Chromate)	
L03	0E03641A	BT3x6 ⊕ Pan (Black Chromate)	
L04	0E03054A	BT3x8 ⊕ Countersunk	
L05	0E03366A	BT3x8 ⊕ Binding (Black Chromate)	
L06	0E00921A	BT3x8 ⊕ Binding (Black Chromate)	
L07	0E00855A	BT2x6 ⊕ Binding	

7.2. Chassis Ass'y (A01)

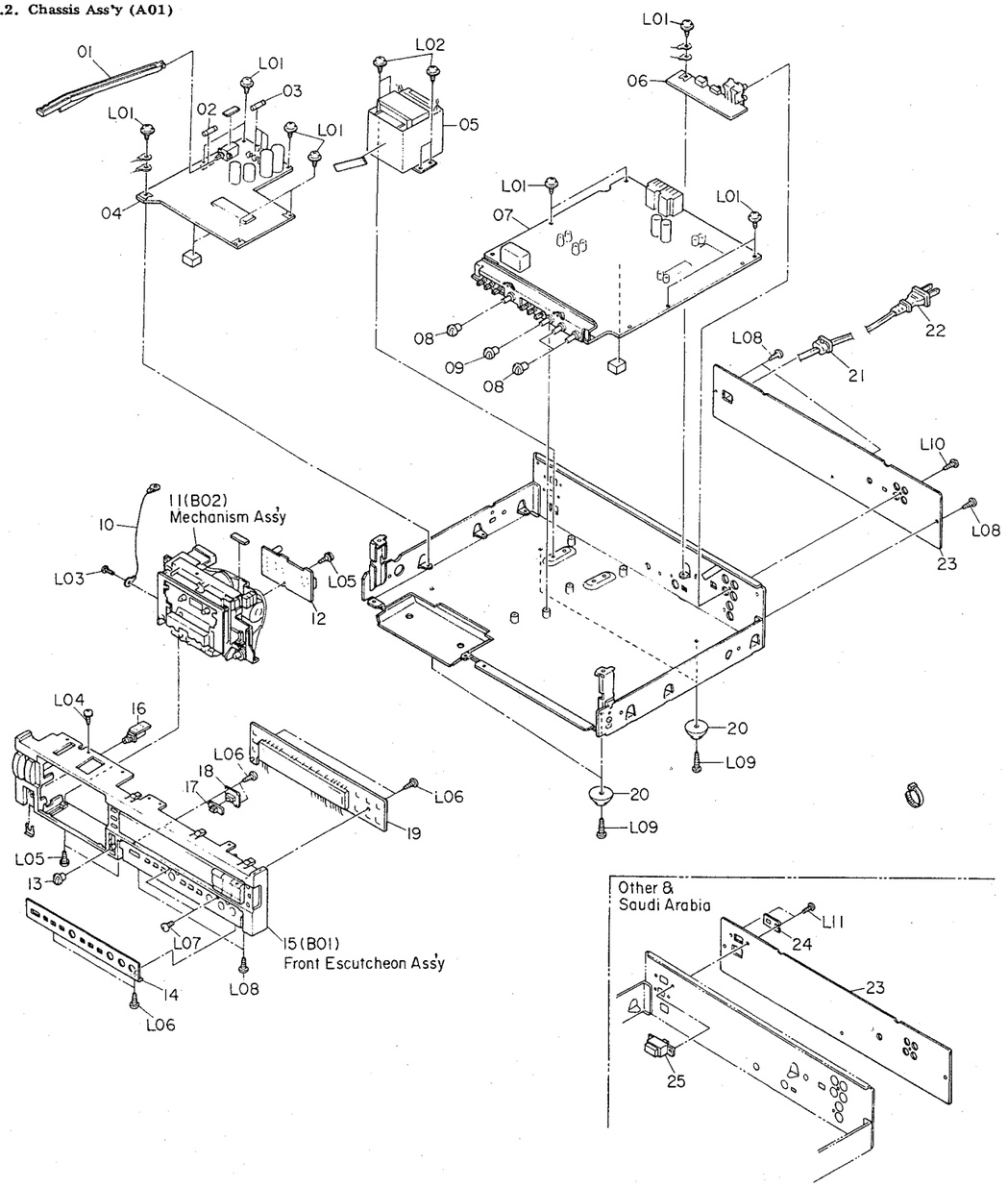


Fig. 7.2

7.3. Front Escutcheon Ass'y (B01)

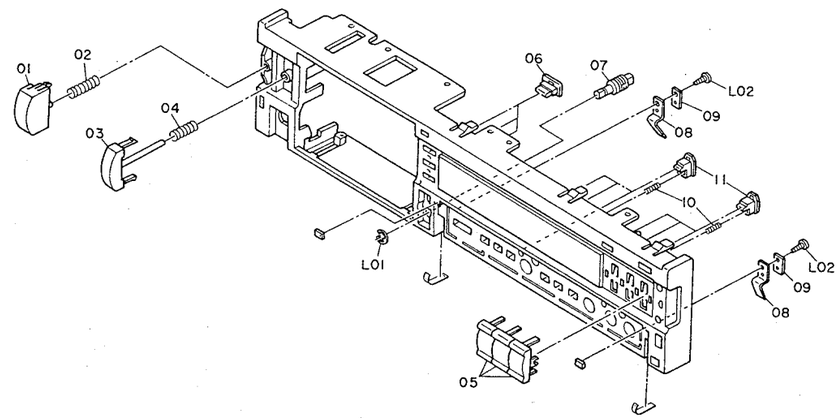


Fig. 7.3

★: Unstocked parts:

Schematic Ref. No.		Part No.	Description	Q'ty
7.2. Chassis Ass'y				
A01		—	Chassis Ass'y	1
01		0J06258B	Power Switch Joint	1
02		0B90493A	Fuse 500mA [F404] (USA, CAN, JPN)	1
		0B08505A	Fuse F500mA [F404] (EP, UK, AUS, OTR, SAU)	1
03		0B90375A	Fuse 1.6A [F401-403] (USA, CAN, JPN)	3
		0B90382A	Fuse T1.25A [F401-403] (EP, UK, AUS, OTR, SAU)	3
04	★	BA07988A	Power Supply & Logic P.C.B. Ass'y (USA, CAN, EP, UK, AUS, OTR, SAU)	1
	★	BA07981A	Power Supply & Logic P.C.B. Ass'y (JPN)	1
05		0B50183A	Power Transformer 120V (USA, CAN)	1
		0B50182A	Power Transformer 230V (EP)	1
		0B50179A	Power Transformer 240V (UK, AUS)	1
		0B50181A	Power Transformer 115-230V (OTR, SAU)	1
		0B50180A	Power Transformer 100V (JPN)	1
06	★	BA07985A	Pin Jack P.C.B. Ass'y	1
07	★	BA07984A	Main P.C.B. Ass'y	1
08		0H05821A	Input & Bias Tuning Volume Knob	3
09		0H05822A	Output Volume Knob	1
10		0B83916A	Mechanism GND Ass'y	1
11		CA09048A	Mechanism Ass'y	1
12	★	BA07987A	Playback Amp. P.C.B. Ass'y	1
13		0H05711A	Playback Azimuth Knob	1
14		0H05834A	Inner Panel	1
15		—	Front Escutcheon Ass'y	1
16	★	BA07986A	Headphone P.C.B. Ass'y	1
17		0H05823A	Slide Knob	1
18	★	BA07983A	Timer Switch P.C.B. Ass'y	1
19	★	BA07982A	Control Switch & Display P.C.B. Ass'y	1
20		HA05833A	Leg Ass'y	4
21		0B90280A	Cord Bushing (USA, CAN, EP, UK, AUS)	1
		0B90283A	Cord Bushing (OTR, SAU, JAN)	1
22		0B08504A	Power Cord (USA, CAN)	1
		0B08093U	Power Cord (EP)	1
		0B08348A	Power Cord (UK)	1
		0B05241A	Power Cord (AUS)	1
		0B08533A	Power Cord (OTR, SAU)	1
		0B08219B	Power Cord (JPN)	1
23		0H05835A	Rear Panel (USA, CAN, EP, UK, AUS, JPN)	1
		0H05848A	Rear Panel (OTR, SAU)	1
24		0M05611A	Voltage Lock Plate (OTR, SAU)	1
25		0B07092U	Voltage Selector (OTR, SAU)	1
L01		0E03157A	BT3x8 ⊕ Binding With Washer	
L02		0E03592A	BT4x6 ⊕ Binding Washer Faced (Black Chromate)	
L03		0E03042A	FT2.5x5 ⊕ Pan	
L04		0E03212A	BT2.6x6 ⊕ Binding Toothed Lock	
L05		0E03435A	M2.6x6 ⊕ Binding With Toothed Lock	
L06		0E00921A	BT3x8 ⊕ Binding (Black Chromate)	
L07		0E00896A	M3x6 ⊕ Binding	
L08		0E00860A	BT3x6 ⊕ Binding (Black Chromate)	
L09		0E03012A	BT3x12 ⊕ Binding (Black Chromate)	
L10		0E03366A	BT3x8 ⊕ Binding Projected (Black Chromate)	
L11		0E00985A	M3x6 ⊕ Binding (Black Chromate) (OTR, SAU)	
7.3. Front Escutcheon Ass'y (B01)				
B01		—	Front Escutcheon Ass'y	1
01		0H05723A	Power Switch Button	1
02		0C09392A	Power Switch Spring	1
03		HA05929A	Eject Knob Ass'y	1
04		0J06252A	Eject Spring	1
05		0H05716A	Control Knob A	3
06		0H05825B	Tact Knob	3
07		0J06260A	Azimuth Joint	1
08		0J06262A	Sealing Spring	2
09		0J06334A	Lock Plate	2
10		0J06253A	Push Knob Spring	6
11		0H05819A	Push Knob	6
L01		0E00134A	E-Ring 4mm	
L02		0E00921A	BT3x8 ⊕ Binding (Black Chromate)	

★: Unstocked parts:

Schematic Ref. No.		Part No.	Description	Q'ty
7.4. Mechanism Ass'y (B02)				
B02		CA09048A	Mechanism Ass'y	1
01		0C85309A	Eject Arm	1
02		0C85310A	Eject Arm Spring	1
03		CA80006A	Pneumatic Damper Ass'y	1
04		0C82720A	Eject Lever Spring	1
05		0C85414A	Eject Lever	1
06		0C85301A	Cassette Case Holder L	1
07		0C80019B	Eject Spring	1
08		0C80620A	Back Tension Arm Pulley	1
09		0C80621A	Back Tension Arm Belt	1
10		0C80617A	Back Tension Arm Spring	1
11		0C80618A	Back Tension Arm Collar	1
12		0C80619A	Back Tension Arm	1
13		0C85425A	Lock Lever Spring	1
14		0C85426A	Lock Lever Collar	1
15		0C85427A	Lock Lever	1
16		CA80726A	Supply Reel Hub Ass'y	1
17		0C80612A	Spring Holder	2
18		0C80614A	Supply Reel Hub Spring	1
19		0C81421A	Supply Pressure Roller Arm Adjustment Nut	1
20		CA80366A	Supply Pressure Roller Arm Ass'y	1
21		0C81420A	Supply Pressure Roller Arm Spring	1
22		0C81422A	Supply Pressure Roller Arm Track Spring	1
23		0H04415C	Head Mount Cover	1
24		CA80200B	Cassette Case Ass'y	1
25		HA05937A	Cover Plate Ass'y	1
26		0C08762A	Head Height Adjustment Gear	2
27		0C08761A	Head Height Adjustment Screw	4
28		0C08763A	Azimuth Aligmment Screw	1
29		0C85424A	Head Mount Plate	1
30		CA08659B	R-3L Record Head Ass'y	1
31		0C08776A	Head Plate Spring L	1
32		CA81676A	RH 4P Connector Ass'y	1
33		0C08026D	PB Head Azimuth Alignment Screw	1
34		0C81391A	PB Head Azimuth Alignment Screw Stopper	1
35		0C85313A	PB Head Azimuth Arm Shaft A	1
36		0C85312A	PB Head Azimuth Arm A	1
37		CA08755A	P2H-3L Playback Head Ass'y	1
38		0C08775A	Head Plate Spring R	1
39		CA81675A	PH 4P Connector Ass'y	1
40		CA81674A	EH 2P Connector Ass'y	1
41		GA02201A	E-4F Erase Head	1
42		0C08768A	E.H. Hold Plate	1
43		0C08889A	E.H. Hold Plate Tapering Spring	2
44		0C08886A	E.H. Hold Plate Spring	1
45		0C82710A	Head Base Hold Plate	1
46		0C80004A	Steel Ball 3mm	1
47		0C08771A	Tape Guide Plate	1
48		CA80365A	Head Base Sub Ass'y	1
49		0C80007A	Steel Ball 2mm	3
50		CA80725A	Take-up Reel Hub Ass'y	1
51		0C80613A	Take-up Reel Hub Spring	1
52		CA80368A	Take-up Pressure Roller Arm Ass'y	1
53		0C81423A	Take-up Pressure Roller Arm Spring	1
54		0C85429A	Switch Hold Plate	1
55		0C80623A	Switch Plate	2
56		0C80624A	Switch Collar A	2
57		0C80626A	Leaf Switch	1
58		0C80625A	Switch Collar B	2
59		0C80017B	Record Protector Lever	1
60		0C80022B	Cassette Hold Spring	1
61		CA80736A	Mechanism Chassis Ass'y	1
62	★	CA80011B	Shut-off P.C.B. Ass'y	1
63		CA08204A	Brake Ass'y	1
64		0C80628A	Brake Spring B	1
65		0C80630A	Brake Arm Collar	1
66		0C80629A	Brake Arm	1
67		0C82724A	Reel Motor Holder	1
68		CA81699A	Reel Motor Ass'y	1
69		0C83380A	Idle Gear	1
70		0C82701A	Supply Capstan Flange	1
71		0C82700A	Take-up Capstan Flange	1
72		0C80428A	Hold Spring	2
73		0C82699A	Supply Flywheel	1
74		0C82698A	Take-up Flywheel	1
75		0C82702A	Capstan Belt	1
76		0C82718A	Thrust Plate	2
77		0C82726A	Floating Rubber	3
78		CA81698A	Capstan Motor Ass'y	1
79		0C85320A	Flywheel Holder	1
80		0C81417A	Cam Gear B	1
81		0C81418A	Control Motor Holder	1
82		0C81416A	Thrust Spring B	1
83		0C80027A	Mode Switch	3
84		0C81415A	Warm Thrust Bush	1
85		CA81646A	Control Motor Ass'y	1
86		0C85319A	Azimuth Arm Spring B	1
87		CA81670A	Azimuth Arm B Sub Ass'y	1
88		CA81669A	Azimuth Plate Sub Ass'y	1
89		0C85314A	Azimuth Cam Gear	1
90		0C85315A	Cassette Case Spring	1
91		0C85316A	Cassette Case Spring Collar	1
92		CA81667A	Azimuth Chassis Sub Ass'y	1
93		0C85318A	Azimuth Cam Spring	1
94		0C85317A	Azimuth Cam Switch	1
95		CA81671A	Azimuth 2P Connector Ass'y	1
96		0C80012A	Sensor Switch	1
97		CA81673A	5P Connector Ass'y	1
98		CA81672A	9P Connector Ass'y	1
L01		0E00698A	E-Ring 2.5mm	
L02		0E00181A	E-Ring 3mm	
L03		0E00222A	E-Ring 2mm	
L04		0E00042A	E-Ring 1.5mm	
L05		0E00165A	E-Ring 1.2mm	
L06		0E03052A	CS Stopper 2.4mm	
L07		0E03042A	FT2.5x 5 ⊕Pan	
L08		0E03043A	FT2.5x10 ⊕Pan	
L09		0E03202A	M2.6x3 ⊕ Binding (Black Chromate)	
L10		0E03437A	FT2.5x3.5 ⊕Pan (Black Chromate)	
L11		0E03654A	M2x4 ⊕Pan (3A)	
L12		0E03018A	M2x5 ⊕Pan	
L13		0E03232A	M1.7x7 ⊕Pan	
L14		0E03222A	Washer 1.8x3.8x0.3	
L15		0E03655A	M2x5 ⊕Pan (2A)	
L16		0E03234A	M2x3 ⊕Pan	
L17		0E03228A	FT3x4 ⊕Pan	
L18		0E03236A	M2x5 ⊕Pan (2A)	
L19		0E03231A	M2x30 ⊕Pan	
L20		0E03041A	FT2.5x4 ⊕Pan	
L21		0E03233A	Washer 2.6x8x1	
L22		0E03230A	ST2.6x12 ⊕Pan	
L23		0E03045A	M2.6x3 ⊕ Binding	
L24		0E03229A	FT5x6 ⊕Pan	
L25		0C82725A	M2.6x9 Washer Faced	
L26		0E00691A	M2x3 ⊕Pan	
L27		0E03044A	FT2.5x20 ⊕Pan	
L28		0E00851A	ST3x5 ⊕Pan	
L29		0E03666A	ST3.5x6 ⊕Pan	
L30		0E03035A	M2x3.2 ⊕ Truss	
L31		0E03235A	Washer 2x5x0.25	
L32		0E03225A	Washer 1.8x3.8x0.5	
L33		0E03226A	Washer 2.1x4.5x0.1	
L34		0C85423A	S. Thrust Spring Washer	
L35		0E03049A	Washer 1.8x3.2x0.5	
L36		0C08774A	Plate Washer L	
L37		0C08773A	Plate Washer R	
L38		0E03227A	Washer 2.7x5x0.5	
L39		0E03237A	Nut Hex. M2.6	
L40		0E00694A	Nut M2	
L41		0C82716A	Capstan Washer S	
L42		0C82717A	Capstan Washer T	
L43		0E00912A	Polyslider FT25	
L44		0E03509A	Washer 1.3x3.4x0.5	
L45		0E03653A	Washer 1.6x4x0.25	
L46		0E03508A	Washer 1.7x6x0.25	
L47		0E03180A	Washer 2.6mm	
L48		0E03645A	Washer 1.6x4x0.25	
L49		0E03194A	Washer 2.1mm	

7.4. Mechanism Ass'y (B02)

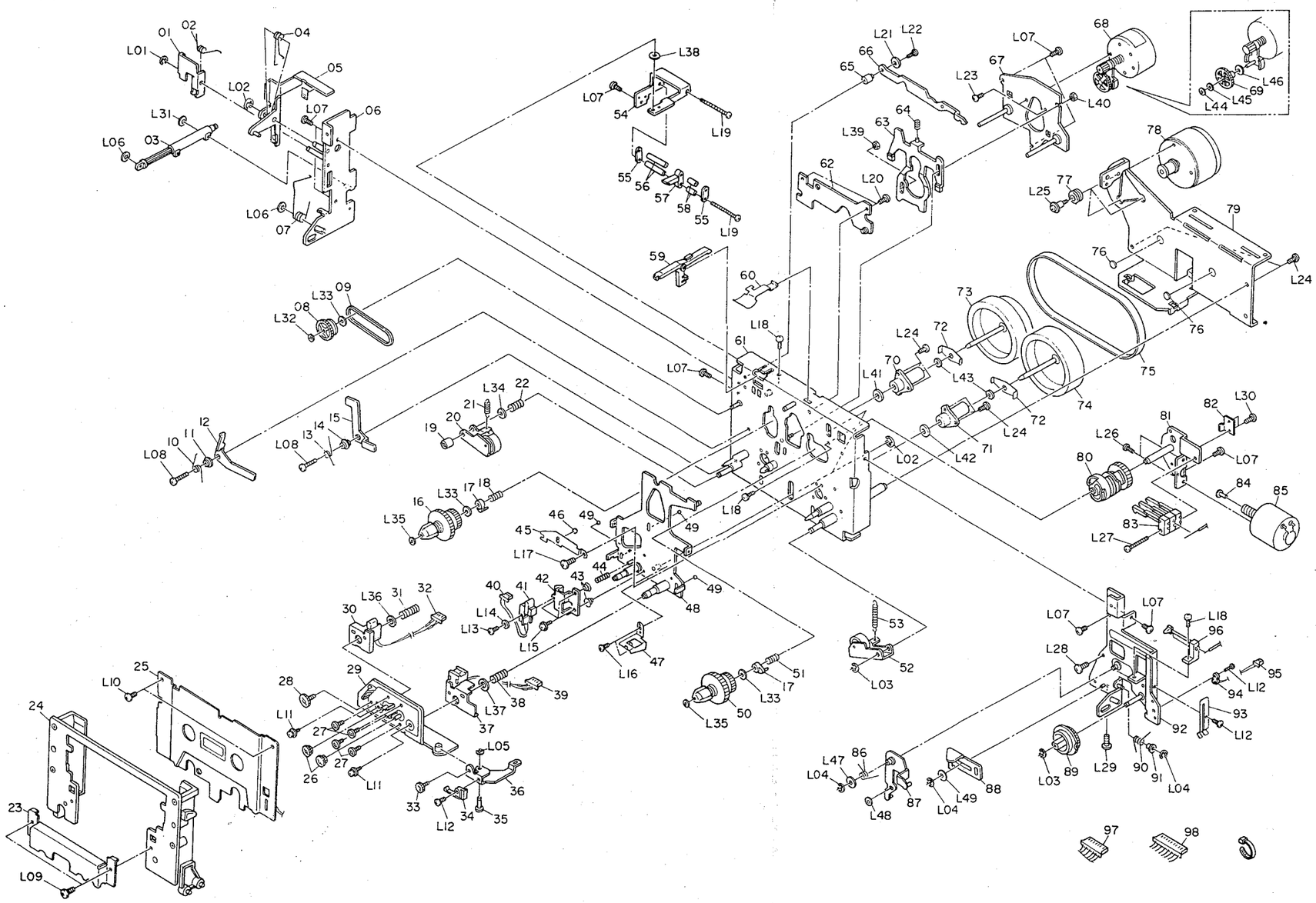


Fig. 7.4

8. MOUNTING DIAGRAMS AND PARTS LIST

Notes:

1. Mounting diagram shows a dip side view of the printed circuit board.
2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
3. Abbreviation for part name:
   TR — Transistor, SiD — Silicon Diode, ZD — Zener Diode, Varicap — Variable Capacitance Diode
   RK — Carbon Resistor, RM — Metal Film Resistor, RF — Fail Safe Type Resistor, RC — Cement Resistor
   CE — Electrolytic Capacitor, CML — Mylar Capacitor, CC — Ceramic Capacitor, CPP — PP Capacitor, CMM — Metalized Mylar Capacitor, CSP — Polystyrene Capacitor, C — Mica Capacitor, CT — Tantalum Capacitor

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
U101	I-8	Q405	F-2
U102	H-5	Q406	F-2
U103	C-3	Q407	F-2
U104	C-4	Q930	A-3
U105	I-10	Q960L	F-9
U106	I-2	Q960R	H-9
U107	C-6	Q980	B-9
U108	H-10	ZD15L	G-10
Q101L	B-3	ZD15R	H-10
Q101R	D-3	ZD96L	G-10
Q102	B-3	ZD96R	H-10
Q105	B-8	ZD301	I-6
Q106L	B-6	ZD302	H-6
Q106R	D-6	ZD303	G-2
Q107L	B-7	ZD304	G-2
Q107R	D-7	ZD401	E-2
Q108L	B-7	D101L	B-2
Q108R	D-7	D101R	B-2
Q109L	B-6	D103L	B-6
Q109R	D-6	D103R	D-5
Q110L	B-6	D104L	B-5
Q110R	D-6	D104R	E-6
Q111L	B-7	D105L	B-5
Q111R	D-7	D105R	E-6
Q112	B-8	D106L	B-5
Q115L	G-5	D106R	E-6
Q115R	G-5	D107L	B-5
Q116L	G-5	D107R	E-6
Q116R	G-4	D108L	B-7
Q117L	G-8	D108R	D-7
Q117R	G-7	D109	B-8
Q118L	G-8	D110L	G-10
Q118R	G-7	D110R	H-10
Q119	B-9	D111L	G-10
Q120	D-9	D111R	H-10
Q121	D-9	D112L	G-5
Q122	D-9	D112R	G-5
Q123	B-9	D113L	G-8
Q124	C-9	D113R	G-7
Q125	C-9	D114	B-9
Q401	D-2	D115	E-9
Q402	E-2	D960L	G-10
Q403	E-2	D960R	H-9
Q404	E-2		

8.1. Main P.C.B. Ass'y

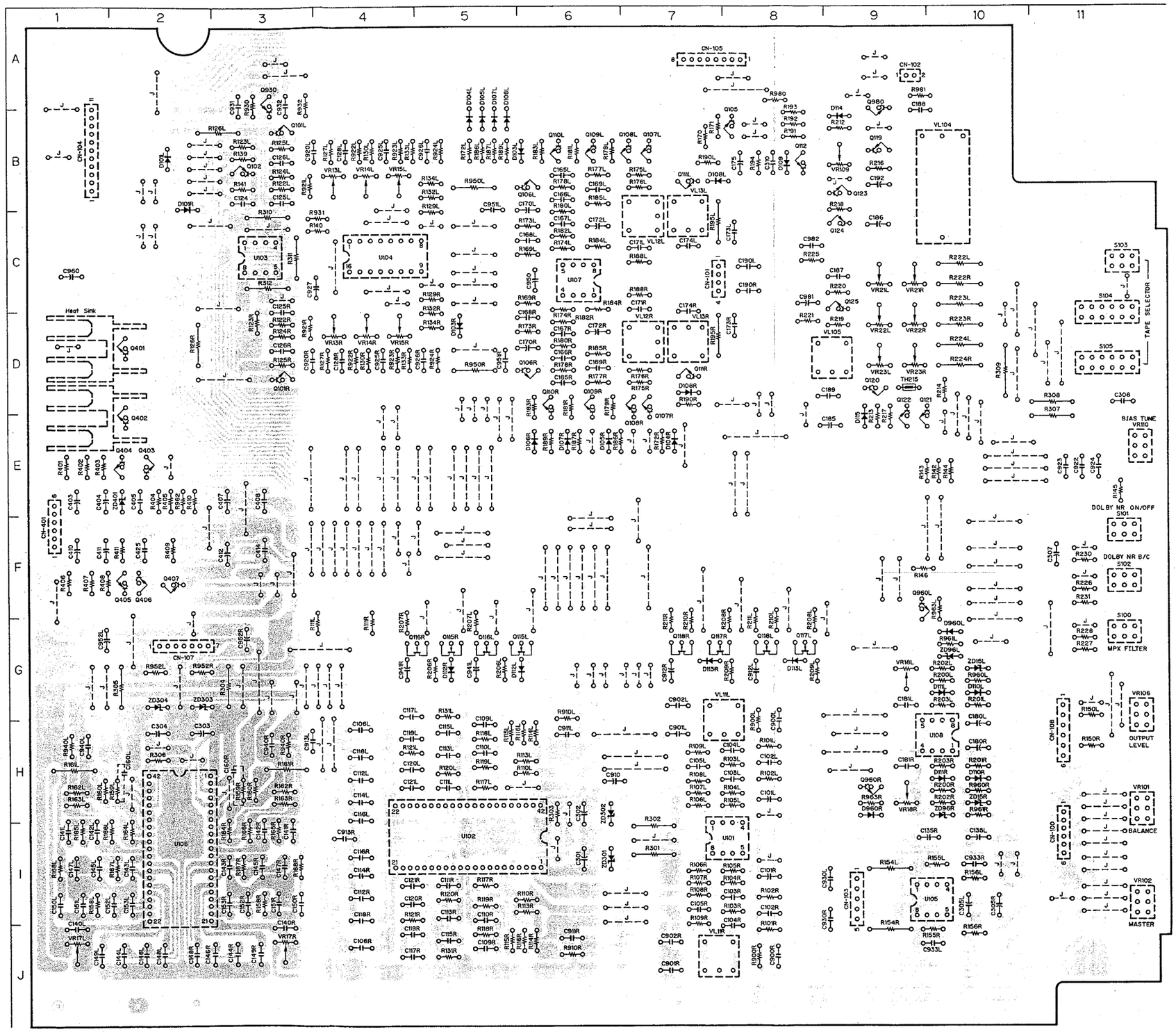


Fig. 8.1

★: Unstocked parts:

Schematic Ref. No.	Part No.	Description
8.1. Main P.C.B. Ass'y		
★	BA07984A	Main P.C.B. Ass'y
	— Input Amp. —	
U101	0B11204A	IC NJM5532DD
VL11L,R	0B51373A	L-C Block (MPX)
VR101	0B30132A	VR 100K (MN)
VR102	0B30133A	VR 100K (A)
R101L,R	0B09749A	RK 1M 1/6W J
R102L,R	0B09717A	RK 47K 1/6W J
R103L,R	0B09717A	RK 47K 1/6W J
R104L,R	0B09709A	RK 22K 1/6W J
R105L,R	0B09677A	RK 1K 1/6W J
R106L,R	0B09677A	RK 1K 1/6W J
R107L,R	0B25236A	RM 2.67K 1/4W F
R108L,R	0B25236A	RM 2.67K 1/4W F
R109L,R	0B25267A	RM 5.62K 1/4W F
R900L,R	0B09725A	RK 100K 1/6W J
C101L,R	0B40778A	CE 10μ 25V
C102L,R	0B47197A	CSP 33P 160V J
C103L,R	0B47142A	CSP 68P 160V J
C104L,R	0B47197A	CSP 33P 160V J
C105L,R	0B01802A	CML 2200P 50V J
C900L,R	0B47154A	CML 120P 50V J
C901L,R	0B09189A	CML 2700P 50V J
C902L,R	0B41139A	CPP 3900P 100V J
	— Encoder —	
U102	0B11363A	IC CX20188
ZD301,302	0B12695A	ZD 10V MA4100(N)
R110L,R	0B25267A	RM 5.62K 1/4W F
R113L,R	0B25195A	RM 1K 1/4W F
R114L,R	0B25304A	RM 13.7K 1/4W F
R115L,R	0B25251A	RM 3.83K 1/4W F
R116L,R	0B25244A	RM 3.24K 1/4W F
R117L,R	0B09749A	RK 1M 1/6W J
R118L,R	0B25171A	RM 562 1/4W F
R119L,R	0B25324A	RM 22.1K 1/4W F
R120L,R	0B09698A	RK 7.5K 1/6W J
R121L,R	0B09673A	RK 680 1/6W J
R131L,R	0B09700A	RK 9.1K 1/6W J
R301,302	0B09508A	RF 56 1/4W J
R303	0B25398A	RM 130K 1/4W F
R910L,R	0B25099A	RM 100 1/4W F
C106L,R	0B40474A	CE 47μ 16V (BP)
C109L,R	0B41133A	CPP 2200P 100V G
C110L,R	0B41133A	CPP 2200P 100V G
C111L,R	0B41139A	CPP 3900P 100V G
C112L,R	0B41306A	CML 0.47μ 50V J
C113L,R	0B40817A	CE 1μ 50V (BP)
C114L,R	0B41300A	CML 0.15μ 50V J
C115L,R	0B41288A	CML 0.015μ 50V J
C116L,R	0B41302A	CML 0.22μ 50V J
C117L,R	0B40817A	CE 1μ 50V (BP)
C118L,R	0B41296A	CML 0.068μ 50V J
C119L,R	0B41295A	CML 0.056μ 50V J
C120L,R	0B41143A	CPP 5600P 100V G
C121L,R	0B41286A	CML 0.01μ 50V J
C301,302	0B40608A	CE 470μ 16V
C910	0B40778A	CE 10μ 25V
C911L,R	0B47154A	CML 120P 50V J
C913L,R	0B47154A	CML 120P 50V J
	— Rec. Amp. —	
U107	0B11204A	IC NJM5532DD
Q105	0B10053A	TR DTA144ES
Q106L,R	0B06299A	TR 2SC2878
Q107L,R	0B10033A	TR 2SC1740S (S)
Q108L,R	0B10033A	TR 2SC1740S (S)
Q109L,R	0B10033A	TR 2SC1740S (S)
Q110L,R	0B10033A	TR 2SC1740S (S)
Q111L,R	0B06299A	TR 2SC2878
Q112	0B10029A	TR 2SA933S (S)
D103L,R	0B06398A	SiD 1SS176
D104L,R	0B06398A	SiD 1SS176
D105L,R	0B06398A	SiD 1SS176
D106L,R	0B06398A	SiD 1SS176
D107L,R	0B06398A	SiD 1SS176
D108L,R	0B06398A	SiD 1SS176
D109	0B06398A	SiD 1SS176
VL12L,R	0B51374A	Coil 15.8mH
VL13L,R	0B51370A	Trap Coil 1.05mH
R169L,R	0B09711A	RK 27K 1/6W J
R170	0B09701A	RK 10K 1/6W J
R171	0B09725A	RK 100K 1/6W J
R172L,R	0B09709A	RK 22K 1/6W J
R173L,R	0B09733A	RK 220K 1/6W J
R174L,R	0B25195A	RM 1K 1/4W F
R175L,R	0B09685A	RK 2.2K 1/6W J
R176L,R	0B09677A	RK 1K 1/6W J
R177L,R	0B25252A	RM 3.92K 1/4W F
R178L,R	0B09694A	RK 5.1K 1/6W J
R179L,R	0B09741A	RK 470K 1/6W J
R180L,R	0B09693A	RK 4.7K 1/6W J
R181L,R	0B09741A	RK 470K 1/6W J
R182L,R	0B09695A	RK 5.6K 1/6W J
R183L,R	0B09741A	RK 470K 1/6W J
R184L,R	0B09733A	RK 220K 1/6W J
R185L,R	0B25365A	RM 59.0K 1/4W F
R186L,R	0B09709A	RK 22K 1/6W J
R187L,R	0B09709A	RK 22K 1/6W J
R188L,R	0B25213A	RM 1.54K 1/4W F
R189L,R	0B09709A	RK 22K 1/6W J
R190L,R	0B09695A	RK 5.6K 1/6W J
R191	0B09717A	RK 47K 1/6W J
R192	0B09701A	RK 10K 1/6W J
R193	0B09721A	RK 68K 1/6W J
R194	0B09701A	RK 10K 1/6W J
R195L,R	0B09629A	RK 10 1/6W J
R950L,R	0B09701A	RK 10K 1/6W J
C165L,R	0B41133A	CPP 2200P 100V G
C166L,R	0B01914A	CML 3300P 50V J
C167L,R	0B05582A	CML 0.022μ 50V J
C168L,R	0B09045A	CML 0.027μ 50V J
C169L,R	0B05682A	CML 0.068μ 50V J
C170L,R	0B40557A	CE 1μ 50V
C171L,R	0B01914A	CML 3300P 50V J
C172L,R	0B40559A	CE 47μ 16V
C173L,R	0B41795A	CSP 330P 160V J
C174L,R	0B47146A	CSP 2200P 160V J
C175	0B40778A	CE 10μ 25V
C310	0B05550A	CML 1000P 50V J
C950	0B40798A	CE 330μ 35V
C951L,R	0B05550A	CML 1000P 50V J
CN101	0B81461A	4P T-Post
	— Rec. Eq. Amp. —	
U103	0B11204A	IC NJM5532DD
U104	0B11027A	IC TC9145P
Q101L,R	0B10033A	TR 2SC1740S (S)
Q102	0B10029A	TR 2SA933S (S)
Q930	0B10029A	TR 2SA933S (S)
D101L,R	0B06398A	SiD 1SS176
VR13L,R	0B32193A	Semi VR 10K
VR14L,R	0B32193A	Semi VR 10K
VR15L,R	0B32194A	Semi VR 20K
R111L,R	0B09733A	RK 220K 1/6W J
R122L,R	0B09705A	RK 15K 1/6W J
R123L,R	0B09703A	RK 12K 1/6W J
R124L,R	0B25276A	RM 6.98K 1/4W F
R125L,R	0B09749A	RK 1M 1/6W J
R126L,R	0B09701A	RK 10K 1/6W J
R127L,R	0B09701A	RK 10K 1/6W J
R129L,R	0B09693A	RK 4.7K 1/6W J
R130L,R	0B09697A	RK 6.8K 1/6W J
R132L,R	0B09689A	RK 3.3K 1/6W J
R133L,R	0B09701A	RK 10K 1/6W J
R134L,R	0B09701A	RK 10K 1/6W J
R139	0B09717A	RK 47K 1/6W J
R140,141	0B09725A	RK 100K 1/6W J
R142,143	0B09733A	RK 220K 1/6W J
R144	0B09733A	RK 220K 1/6W J
R145,146	0B09693A	RK 4.7K 1/6W J
R310	0B09693A	RK 4.7K 1/6W J
R311	0B09701A	RK 10K 1/6W J
R312	0B09693A	RK 4.7K 1/6W J
R921L,R	0B09705A	RK 15K 1/6W J
R922L,R	0B09694A	RK 5.1K 1/6W J
R923L,R	0B09701A	RK 10K 1/6W J
R924L,R	0B09701A	RK 10K 1/6W J
R930,931	0B09725A	RK 100K 1/6W J
R932	0B09717A	RK 47K 1/6W J
C124	0B41298A	CML 0.1μ 50V J
C125L,R	0B09993A	CML 820P 50V J
C126L,R	0B41149A	CPP 0.01μ 100V G
C128L,R	0B09045A	CML 0.027μ 50V J
C920L,R	0B40474A	CE 47μ 16V (BP)
C922,923	0B41298A	CML 0.1μ 50V J
C924	0B41298A	CML 0.1μ 50V J
C925L,R	0B09045A	CML 0.027μ 50V J
C926L,R	0B41143A	CPP 5600P 100V G
C927	0B40799A	CE 100μ 35V
C931,932	0B41298A	CML 0.1μ 50V J
	— Decoder —	
U106	0B11363A	IC CX20188
ZD303,304	0B12695A	ZD 10V MA4100(N)
VR17L,R	0B32192A	Semi VR 5K
R158L,R	0B09673A	RK 680 1/6W J
R159L,R	0B09725A	RK 100K 1/6W J
R160L,R	0B25195A	RM 1K 1/4W F
R161L,R	0B09420A	RM 2.2K 1/4W F
R162L,R	0B25244A	RM 3.24K 1/4W F
R163L,R	0B25251A	RM 3.83K 1/4W F
R164L,R	0B09749A	RK 1M 1/6W J
R165L,R	0B25171A	RM 562 1/4W F
R166L,R	0B25324A	RM 22.1K 1/4W F
R167L,R	0B09698A	RK 7.5K 1/6W J
R168L,R	0B09700A	RK 9.1K 1/6W J
R304,305	0B09508A	RF 56 1/4W J
R306	0B25398A	RM 130K 1/4W F
R940L,R	0B25099A	RM 100 1/4W F
C140L,R	0B47154A	CML 120P 50V J
C141L,R	0B41133A	CPP 2200P 100V G
C142L,R	0B41133A	CPP 2200P 100V G
C143L,R	0B41139A	CPP 3900P 100V G
C144L,R	0B41306A	CML 0.47μ 50V J
C145L,R	0B40817A	CE 1μ 50V (BP)
C146L,R	0B41300A	CML 0.15μ 50V J
C147L,R	0B41288A	CML 0.015μ 50V J
C148L,R	0B41302A	CML 0.22μ 50V J
C149L,R	0B41296A	CML 0.068μ 50V J
C150L,R	0B40817A	CE 1μ 50V (BP)
C151L,R	0B41295A	CML 0.056μ 50V J
C152L,R	0B41143A	CPP 5600P 100V G
C153L,R	0B41286A	CML 0.01μ 50V J
C160L,R	0B41201A	CPP 100P 100V J
C303,304	0B40608A	CE 470μ 16V
C940L,R	0B47154A	CML 120P 50V J
	— Headphone Amp. —	
U105	0B11365A	IC M5216
VR106	0B30131A	VR 10K(A)
R150L,R	0B25661A	RM 2.2K 1/4W F
R154L,R	0B09216A	RF 10 1/4W J
R155L,R	0B09717A	RK 47K 1/6W J
R156L,R	0B09717A	RK 47K 1/6W J
C135L,R	0B40778A	CE 10μ 25V
C305L,R	0B40780A	CE 100μ 16V
C930L,R	0B41139A	CPP 3900P 100V G
C933L,R	0B47142A	CSP 68P 160V J
	0B81235A	5P T-Post (1)
	— Power Supply —	
Q401,402	0B06452A	TR 2SD1406
Q403,404	0B06142A	TR 2SC2240
Q405,406	0B10050A	TR 2SA970
Q407	0B06451A	TR 2SB1015
ZD401	0B12705A	ZD 5.1V MA4051N-M
R401,402	0B09685A	RK 2.2K 1/6W J
R403	0B09677A	RK 1K 1/6W J
R404	0B25667A	RM 3.9K 1/4W F
R405	0B25669A	RM 4.7K 1/4W F
R406,407	0B09685A	RK 2.2K 1/6W J
R408	0B09677A	RK 1K 1/6W J
R409	0B22570A	RM 12K 1/4W F
R410	0B25308A	RM 15K 1/4W F
R411	0B09669A	RK 470 1/6W J
R962	0B09682A	RK 1.6K 1/6W J
C403,404	0B40800A	CE 100μ 25V
C405	0B41298A	CML 0.1μ 50V J
C407	0B40705A	CE 3300μ 16V
C408	0B41298A	CML 0.1μ 50V J
C410,411	0B40800A	CE 100μ 25V
C412	0B40361A	CE 2200μ 16V
C414	0B41298A	CML 0.1μ 50V J
C425	0B41298A	CML 0.1μ 50V J
	0B90448A	Heat Sink (2)
	— Tape/Source Switch —	
Q115L,R	0B10022A	TR FET 2SK246
Q116L,R	0B10022A	TR FET 2SK246
Q117L,R	0B10022A	TR FET 2SK246
Q118L,R	0B10022A	TR FET 2SK246
D112L,R	0B06398A	SiD 1SS176
D113L,R	0B06398A	SiD 1SS176
R206L,R	0B09749A	RK 1M 1/6W J
R207L,R	0B09725A	RK 100K 1/6W J
R208L,R	0B09733A	RK 220K 1/6W J
R209L,R	0B09749A	RK 1M 1/6W J
R210L,R	0B09733A	RK 220K 1/6W J
R211L,R	0B09725A	RK 100K 1/6W J
C912L,R	0B40778A	CE 10μ 25V
C941L,R	0B40778A	CE 10μ 25V
	— Bias Osc. —	
Q119	0B10055A	TR DTA124ES
Q120	0B10070A	TR DTC143ES
Q121	0B10033A	TR 2SC1740S (S)
Q122	0B06069A	TR 2SB564
Q123	0B10033A	TR 2SC1740S (S)
Q124	0B06451A	TR 2SB1015
Q125	0B10222A	TR 2SC2705 (Y)
Q980	0B10053A	TR DTA144ES
D114,115	0B06398A	SiD 1SS176
VL104	0B51047A	Bias Osc.
VL105	0B51372A	Osc. Tune
TH215	0B19006A	Thermistor 3.3K
VR109	0B32192A	Semi VR 5K
VR110	0B30138A	Volume 10K
R212,213	0B09665A	RK 330 1/6W J
R214	0B09701A	RK 10K 1/6W J
R216	0B9711A	RK 27K 1/6W J
R217	0B09653A	RK 100 1/6W J
R218	0B09701A	RK 10K 1/6W J
R219	0B09725A	RK 100K 1/6W J
R220	0B09701A	RK 10K 1/6W J
R221	0B09617A	RK 3.3 1/6W J
R225	0B09701A	RK 10K 1/6W J
R952L,R	0B09648A	RK 62 1/6W J
R980	0B09717A	RK 47K 1/6W J
R981	0B09693A	RK 4.7K 1/6W J
C185,186	0B40780A	CE 100μ 16V
C187	0B09993A	CML 820P 50V J
C188	0B41255A	CPP 0.018μ 100V J
C189	0B41261A	CPP 0.033μ 100V J
C192	0B40778A	CE 10μ 25V
C952L,R	0B40608A	CE 470μ 16V
C981	0B40115A	CE 4.7μ 50V
C982	0B41196A	CSP 470P 160V J
CN102	0B81459A	2P T-Post
	— Bias Adj. —	
VR21L,R	0B32195A	Semi VR 50K
VR22L,R	0B32194A	Semi VR 20K
VR23L,R	0B32193A	Semi VR 10K
R222L,R	0B09705A	RK 15K 1/6W J
R223L,R	0B09697A	RK 6.8K 1/6W J
R224L,R	0B09653A	RK 100 1/6W J
	— Meter Amp. —	
U108	0B06124A	IC NJM4558D
Q960L,R	0B06299A	TR 2SC2878
ZD15L,R	0B12714A	ZD 3.3V RD3.3ESB1
ZD96L,R	0B12289A	ZD 5.1V MTZ5.1C
D110L,R	0B06398A	SiD 1SS176
D111L,R	0B06398A	SiD 1SS176
D960L,R	0B06398A	SiD 1SS176
VR18L,R	0B32192A	Semi VR 5K
R200L,R	0B09749A	RK 1M 1/6W J
R201L,R	0B09741A	RK 470K 1/6W J
R202L,R	0B09677A	RK 1K 1/6W J
R203L,R	0B09677A	RK 1K 1/6W J
R960L,R	0B09696A	RK 6.2K 1/6W J
R961L,R	0B09682A	RK 1.6K 1/6W J
R963L,R	0B09701A	RK 10K 1/6W J
C180L,R	0B40257A	CE 3.3μ 50V (LN)
C181L,R	0B40817A	CE 1μ 50V (BP)
C960	0B40608A	CE 470μ 16V
	— Push Switch —	
R226	0B09701A	RK 10K 1/6W J
R227	0B09685A	RK 2.2K 1/6W J
R228	0B09709A	RK 22K 1/6W J
R230,231	0B09701A	RK 10K 1/6W J
R307	0B09711A	RK 27K 1/6W J
R308,309	0B09725A	RK 100K 1/6W J
C190L,R	0B41196A	CSP 470P 160V J
C307	0B40559A	CE 47μ 16V
C308	0B41298A	CML 0.1μ 50V
S100-102	0B70177A	Push Switch MPX-DOLBY (1)
S103-105	0B70176A	Push Switch TAPE (1)
	— Miscellaneous —	
	0B60849A	Main P.C.B.
CN100	0B83926A	6P H-Connector Ass'y 330
CN103	0B83929B	5P H-Connector Ass'y 600
CN104	0B83932A	11P H-Connector Ass'y 250
CN105	0B83931B	8P H-Connector Ass'y 150
CN107	0B83928A	7P H-Connector Ass'y 410
CN108	0B83925A	6P H-Connector Ass'y 360
CN401	0B83930B	6P H-Connector Ass'y 270
	0E00174A	Earth Lug B-4 (2)
	0E00985A	M3x6 ⊕ Binding (Black Chromate) (2)
	0J06254A	Volume Holder (1)

8.2. Power Supply & Logic P.C.B. Ass'y

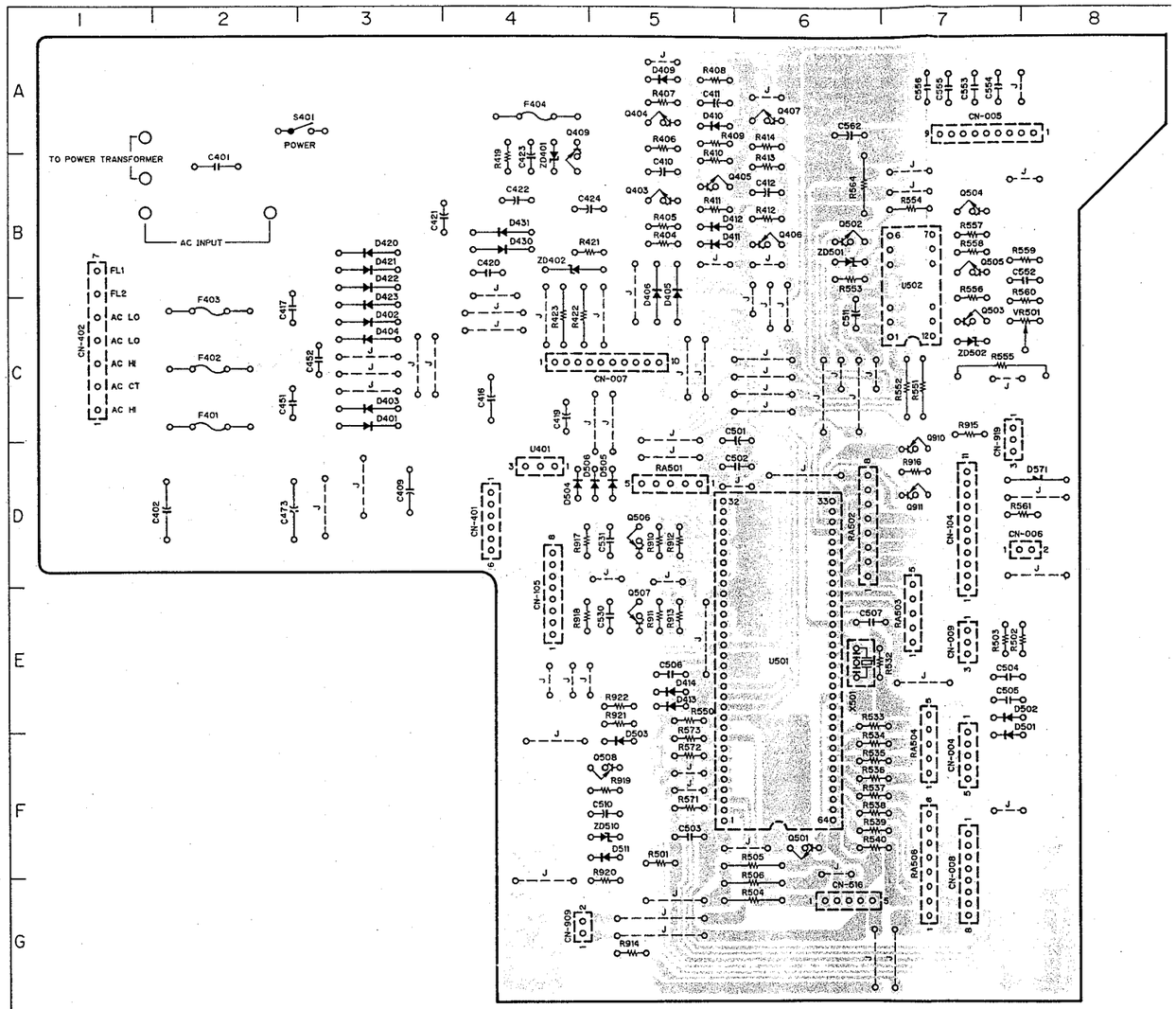


Fig. 8.2

• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
U401	D-4	Q503	C-7	ZD502	C-7	D412	B-5	D503	F-5
U501	E-6	Q504	B-7	ZD510	F-5	D413	E-5	D504	D-4
U502	B-7	Q505	B-7	D401	C-3	D414	E-5	D505	D-5
Q403	B-5	Q506	D-5	D402	C-3	D420	B-3	D506	D-4
Q404	A-5	Q507	E-5	D403	C-3	D421	B-3	D511	F-5
Q405	B-5	Q508	F-5	D404	C-3	D422	B-3	D571	D-8
Q406	B-6	Q910	C-7	D405	B-5	D423	B-3		
Q407	A-6	Q911	D-7	D406	B-5	D430	B-4		
Q409	A-4	ZD401	B-4	D409	A-5	D431	B-4		
Q501	F-6	ZD402	B-4	D410	A-5	D501	E-7		
Q502	B-6	ZD501	B-6	D411	B-5	D502	E-7		

★: Unstocked parts:

Schematic Ref. No.	Part No.	Description
8.2. Power Supply & Logic P.C.B Ass'y		
★	BA07988A	Power Supply & Logic P.C.B. Ass'y (USA, CAN, EP, UK, AUS, OTR, SAU)
★	BA07981A	Power Supply & Logic P.C.B Ass'y (JPN)
	— Power Supply —	
U401	0B11753A	IC NJM7805FA
Q403,404	0B10033A	TR 2SC1740S (S)
Q405	0B10033A	TR 2SC1740S (S)
Q406	0B10058A	TR DTA114ES
Q407	0B10033A	TR 2SC1740S (S)
Q409	0B10015A	TR 2SA1020
ZD401	0B12708A	ZD 24V MA4240N-H
ZD402	0B12707A	ZD 4.7V MA4047N
D401,402	0B12365A	SiD 1SR35-100A
D403,404	0B12365A	SiD 1SR35-100A
D405,406	0B12365A	SiD 1SR35-100A
D409,410	0B06398A	SiD 1SS176
D411,412	0B06398A	SiD 1SS176
D420,421	0B12365A	SiD 1SR35-100A
D422,423	0B12365A	SiD 1SR35-100A
D430,431	0B12365A	SiD 1SR35-100A
R404	0B09709A	RK 22K 1/6W J
R405	0B09703A	RK 12K 1/6W J
R406	0B09701A	RK 10K 1/6W J
R407,408	0B09693A	RK 4.7K 1/6W J
R409	0B09719A	RK 56K 1/6W J
R410	0B09713A	RK 33K 1/6W J
R411,412	0B09693A	RK 4.7K 1/6W J
R413	0B09719A	RK 56K 1/6W J
R414	0B09713A	RK 33K 1/6W J
R419	0B09685A	RK 2.2K 1/6W J
R421	0B09701A	RK 10K 1/6W J
R422,423	0B09653A	RK 100 1/6W J
C401	0B41825A	CC 4700P AC400V (USA, CAN, EP, UK, AUS, OTR, SAU)
	0B41826A	CC 4700P AC250 (JPN)
C402	0B40801A	CE 6800μ 25V
C409	0B40363A	CE 2200μ 25V
C410	0B40630A	CE 22μ 10V (LN)
C411,412	0B40255A	CE 1μ 50V (LN)
C416	0B40362A	CE 6800μ 16V
C417	0B41298A	CML 0.1μ 50V J
C419	0B40067A	CE 470μ 10V
C420	0B41298A	CML 0.1μ 50V J
C421	0B40798A	CE 330μ 35V
C422	0B40120A	CE 100μ 50V
C423	0B40100A	CE 10μ 35V
C424	0B40802A	CE 1000μ 35V
C451,452	0B41298A	CML 0.1μ 50V J
C473	0B40801A	CE 6800μ 25V
S401	0B71012A	Power Switch 1P TV-4
CN401	0B81463A	6P T-Post
CN402	0B81574A	7P T-Post
	0B08349B	Fuse Clip (8)
	0E03355A	Earth Lug for P.C.B. (4)
	— Motor Driver —	
U502	0B11368A	IC IC LB1649
Q502	0B10062A	TR DTC144ES
Q503	0B10029A	TR 2SA933S (S)
Q504	0B10062A	TR DTC144ES
Q505	0B10033A	TR 2SC1740S (S)
ZD501	0B12290A	ZD 5.6V MTZ5.6A
ZD502	0B12288A	ZD 5.1V MTZ5.1B
D413,414	0B06398A	SiD 1SS176
D503,504	0B06398A	SiD 1SS176
D505,506	0B06398A	SiD 1SS176
VR501	0B32192A	Semi VR 5K
R551,552	0B01857A	RK 1K 1/4W J
R553,554	0B09677A	RK 1K 1/6W J
R555	0B24349A	RF 27 1/2W
R556	0B09701A	RK 10K 1/6W J
R557	0B09681A	RK 1.5K 1/6W J
R558	0B09695A	RK 5.6K 1/6W J
R559	0B09717A	RK 47K 1/6W J
R560	0B09677A	RK 1K 1/6W J
R561	0B09669A	RK 470 1/6W J
R564	0B09217A	RF 5.6 1/4W J
C551	0B40078A	CE 100μ 16V
C552	0B41286A	CML 0.01μ 50V J
C553,554	0B41298A	CML 0.1μ 50V J
C555,556	0B41298A	CML 0.1μ 50V J
C562	0B40079A	CE 220μ 16V
CN005	0B84084A	9P T-Post
CN006	0B84278A	2P T-Post
	— MPU —	
U501	0B11884A	IC μPD75106CW
Q501	0B10068A	TR DTC114ES
Q506,507	0B10029A	TR 2SA933S (S)
Q508	0B10029A	TR 2SA933S (S)
Q910,911	0B10053A	TR DTA144ES
ZD510	0B12695A	ZD 10V MA4100(N)
D501,502	0B06398A	SiD 1SS176
D511	0B06398A	SiD 1SS176
D571	0B12634A	Varistor 02YS
X501	0B92045A	Crystal 4.0MHZ
RA501	0B21101A	R Network 10Kx3
RA502	0B21102A	R Network 10Kx6
RA503	0B21101A	R Network 10Kx3
RA504	0B21101A	R Network 10Kx3
RA506	0B21102A	R Network 10Kx6
R501	0B09689A	RK 3.3K 1/6W J
R502,503	0B09701A	RK 10K 1/6W J
R504,505	0B09701A	RK 10K 1/6W J
R506	0B09701A	RK 10K 1/6W J
R532,533	0B09677A	RK 1K 1/6W J
R534,535	0B09677A	RK 1K 1/6W J
R536,537	0B09677A	RK 1K 1/6W J
R538,539	0B09677A	RK 1K 1/6W J
R540	0B09677A	RK 1K 1/6W J
R550	0B09701A	RK 10K 1/6W J
R571	0B09677A	RK 1K 1/6W J
R572,573	0B09701A	RK 10K 1/6W J
R910,911	0B09709A	RK 22K 1/6W J
R912,913	0B09725A	RK 100K 1/6W J
R914	0B09701A	RK 10K 1/6W J
R915,916	0B09661A	RK 220 1/6W J
R917,918	0B09725A	RK 100K 1/6W J
R919	0B09721A	RK 68K 1/6W J
R920	0B09669A	RK 470 1/6W J
R921	0B09725A	RK 100K 1/6W J
R922	0B09701A	RK 10K 1/6W J
C501	0B40077A	CE 47μ 16V
C502	0B41298A	CML 0.1μ 50V J
C503	0B41302A	CML 0.22μ 50V J
C504,505	0B41286A	CML 0.01μ 50V J
C506,507	0B41274A	CML 1000P 50V J
C510	0B40756A	CE 1μ 50V (LN)
C530,531	0B41290A	CML 0.022μ 50V J
CN004	0B81462A	5P T-Post
CN007	0B84302A	10P T-Post
CN008	0B84296A	8P T-Post
CN009	0B84281A	3P T-Post
CN104	0B84305A	11P T-Post
CN105	0B81465A	8P T-Post
CN516	0B84286A	5P T-Post
CN909	0B81459A	2P T-Post
CN919	0B81460A	3P T-Post
	— Miscellaneous —	
	0B60846A	Power Supply & Logic P.C.B.

8.3. Shut-off P.C.B. Ass'y

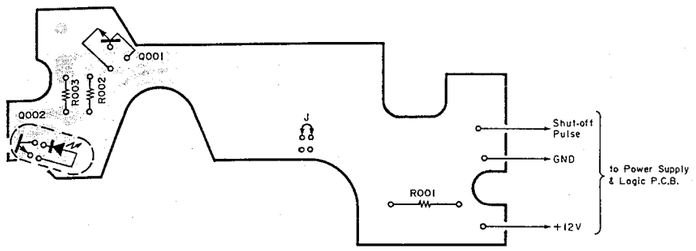


Fig. 8.3

8.4. Timer Switch P.C.B. Ass'y

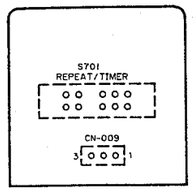


Fig. 8.4

8.5. Headphone P.C.B. Ass'y

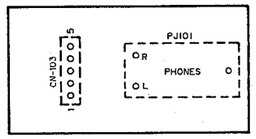


Fig. 8.5

8.6. Pin Jack P.C.B. Ass'y

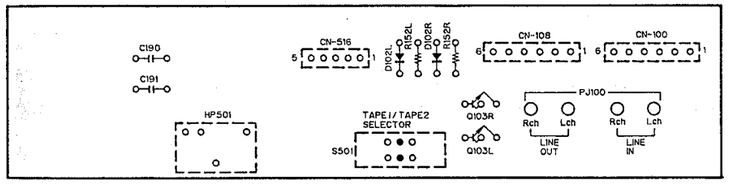


Fig. 8.6

8.7. Playback Amp. P.C.B. Ass'y

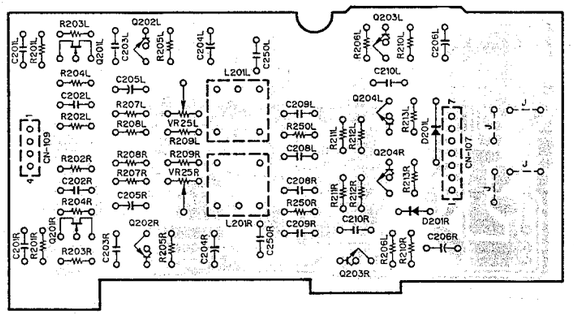


Fig. 8.7

★: Unstocked parts:

Schematic Ref. No.	Part No.	Description
8.3. Shut-off P.C.B. Ass'y		
★	CA80011B	Shut-off P.C.B. Ass'y
	0C80047A	Shut-off P.C.B.
Q001	0B06388A	TR 2SC2812
Q002	0B06389A	Photo Reflector NJL5141
R001	0C81330A	RM 750
R002	0B09841A	RK 15K
R003	0B09840A	RK 680
8.4. Timer Switch P.C.B. Ass'y		
★	BA07983A	Timer Switch P.C.B. Ass'y
	0B60848A	Timer Switch P.C.B.
S701	0B70175A	Slide Switch 2-4
CN009	0B83936A	3P H-Connector Ass'y
8.5. Headphone P.C.B. Ass'y		
★	BA07986A	Headphone P.C.B. Ass'y
	0B60851A	Headphone P.C.B.
PJ101	0B81478A	Headphone Jack
8.6. Pin Jack P.C.B. Ass'y		
★	BA07985A	Pin Jack P.C.B Ass'y
	0B60850A	Pin Jack P.C.B.
Q103L,R	0B06299A	TR 2SC2878
D102L,R	0B06398A	SiD 1SS176
R152L,R	0B09693A	RK 4.7K 1/6W J
C190	0B05550A	CML 1000P 50V J
C191	0B41298A	CML 0.1μ 50V J
S501	0B70178A	Slide Switch 2-2
HP501	0B84028A	Stereo Mini Jack
PJ100	0B84350A	4P Pin Jack
CN516	0B83927A	5P H-Connector Ass'y 300
	0E03355A	Earth Lug for P.C.B. (1)
8.7. Playback Amp. P.C.B. Ass'y		
★	BA07987A	Playback Amp. P.C.B. Ass'y
	0B60852A	Playback Amp. P.C.B.
Q201L,R	0B10383A	FET 2SK369 (GR)
Q202L,R	0B10050A	TR 2SA970 (BL)
Q203L,R	0B06142A	TR 2SC2240 (BL)
Q204L,R	0B10033A	TR 2SC1740S (S)
D201L,R	0B06398A	SiD 1SS176
L201L,R	0B51375A	PB Trap Coil
VR25L,R	0B32190A	Semi VR 1KB
R201L,R	0B09725A	RK 100K 1/6W J
R202L,R	0B25074A	RM 54.6 1/4W F
R203L,R	0B25235A	RM 2.61K 1/4W F
R204L,R	0B25401A	RM 140K 1/4W F
R205L,R	0B09673A	RK 680 1/6W J
R206L,R	0B09713A	RK 33K 1/6W J
R207L,R	0B25672A	RM 6.2K 1/4W F
R208L,R	0B09665A	RK 330 1/6W J
R209L,R	0B09709A	RK 22K 1/6W J
R210L,R	0B09697A	RK 6.8K 1/6W J
R211L,R	0B25292A	RM 10.2K 1/4W F
R212L,R	0B09741A	RK 470K 1/6W J
R213L,R	0B09701A	RK 10K 1/6W J
R250L,R	0B25279A	RM 7.5K 1/4W F
C201L,R	0B41754A	CSP 150P 160V J
C202L,R	0B05582A	CML 0.022μ 50V J
C203L,R	0B41763A	CSP 10P 160V J
C204L,R	0B40066A	CE 330μ 10V
C205L,R	0B40778A	CE 10μ 25V
C206L,R	0B40050A	CE 220μ 6.3V
C208L,R	0B05530A	CML 6800P 50V J
C209L,R	0B41139A	CPP 3900P 100V J
C210L,R	0B47027A	CML 470P 50V J
C250L,R	0B41816A	CSP 220P 160V J
CN107	0B81464A	7P T-Post
CN109	0B81461A	4P T-Post

8.8. Control Switch and Display P.C.B. Ass'y

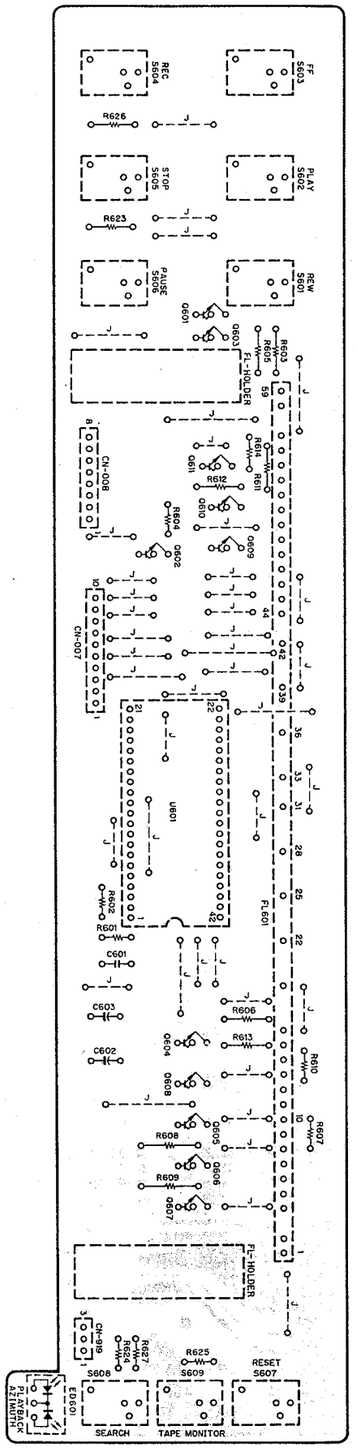


Fig. 8.8

Schematic Ref. No.	Part No.	Description
8.8. Control Switch & Display P.C.B. Ass'y		
★	BA07982A	Control Switch & Display P.C.B. Ass'y
	0B60847A	Control Switch & Display P.C.B.
U601	0B11860A	IC MSC7112-01
Q601,602	0B10033A	TR 2SC1740S (S)
Q603,604	0B10033A	TR 2SC1740S (S)
Q605,606	0B10033A	TR 2SC1740S (S)
Q607,608	0B10033A	TR 2SC1740S (S)
Q609,610	0B10033A	TR 2SC1740S (S)
Q611	0B10033A	TR 2SC1740S (S)
ED601	0B12709A	LED TLSG126
R601	0B09713A	RK 33K 1/6W J
R602	0B09701A	RK 10K 1/6W J
R603,604	0B09717A	RK 47K 1/6W J
R605,606	0B09717A	RK 47K 1/6W J
R607,608	0B09717A	RK 47K 1/6W J
R609,610	0B09717A	RK 47K 1/6W J
R611,612	0B09717A	RK 47K 1/6W J
R613	0B09629A	RK 10 1/6W J
R614	0B09717A	RK 47K 1/6W J
R623	0B09701A	RK 10K 1/6W J
R624	0B09693A	RK 4.7K 1/6W J
R625	0B09705A	RK 15K 1/6W J
R626	0B09701A	RK 10K 1/6W J
R627	0B09693A	RK 4.7K 1/6W J
C601	0B41974A	CC 100P 50V J
C602	0B40158A	CE 100μ 6.3V
S601,602	0B70161A	Tact Switch
S603,604	0B70161A	Tact Switch
S605,606	0B70161A	Tact Switch
S607,608	0B70161A	Tact Switch
S609	0B70161A	Tact Switch
CN007	0B83935A	10P H-Connector Ass'y 400
CN008	0B83934A	8P H-Connector Ass'y 300
CN919	0B83937A	3P H-Connector Ass'y 250
FL601	0B90461A	FL Display FIP13BW7Y
	0J06219C	FL Cushion
	0J06238A	FL Stopper

9. SCHEMATIC DIAGRAM

9.1. IC Block Diagrams

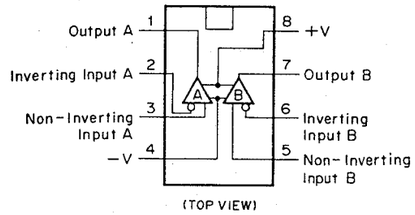


Fig. 9.1.1 Operational Amp. IC 4558D, 5532DD, 5216

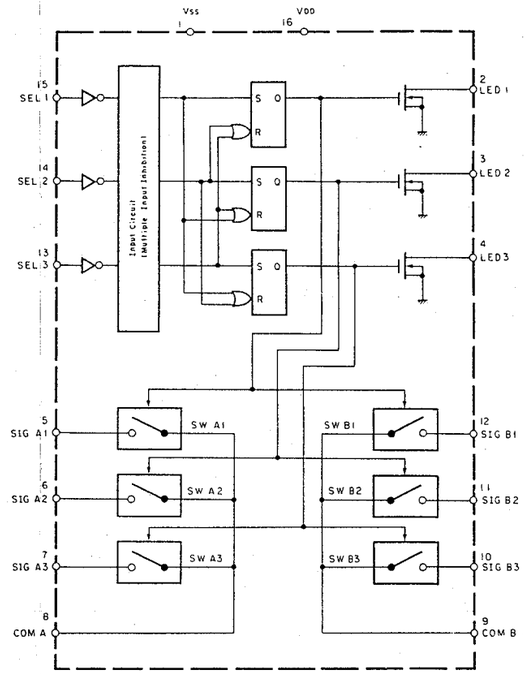
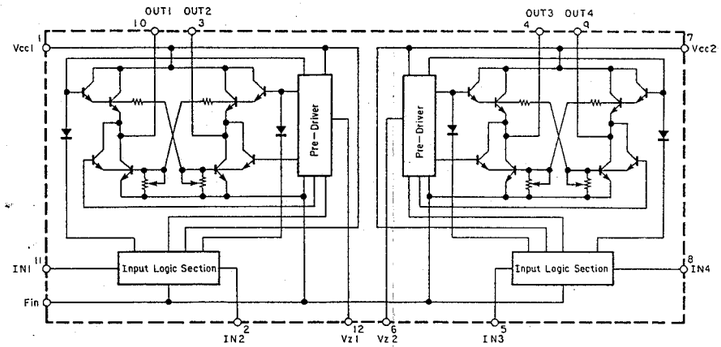


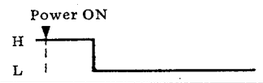
Fig. 9.1.2 Analog Switch Selector TC9145P

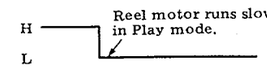
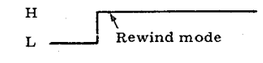
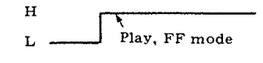
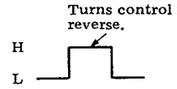
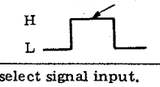


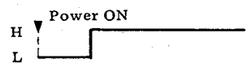
INPUT IN1/3	INPUT IN2/4	OUTPUT OUT1/3	OUTPUT OUT2/4	OPERATION
0	0	0	0	Braking
1	0	1	0	Forward (Reverse)
0	1	0	1	Reverse (Forward)
1	1	0	0	Braking

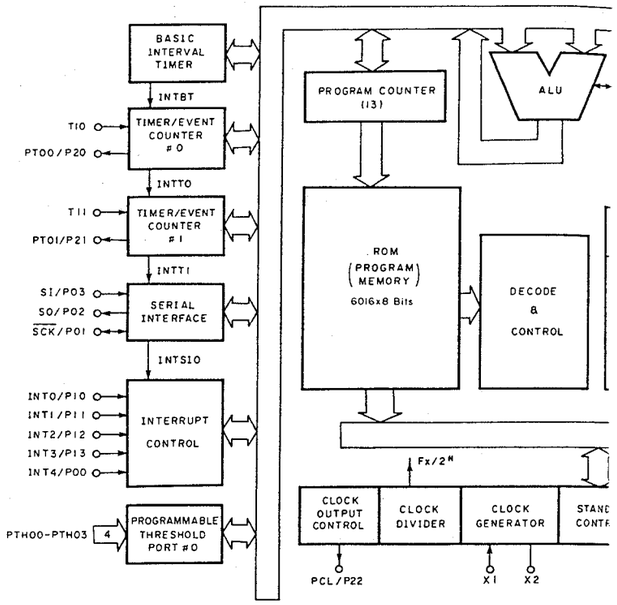
Fig. 9.1.3 Motor Driver IC LB1649

U501 μPD75106CW (Microprocessing Unit (MPU))

Pin No.	Signal Name	In/ Out	Function
1	—	I	Not used. Connected to GND.
2	AZCT	I	Playback azimuth control center detect switch is connected. Becomes "H" when the Playback Azimuth control on the Front Panel is set to the center position.
3	$\overline{REM}$	I	Remote control receiver signal input.
4	RELP	I	Reel motor pulse input. Pulse train is input while take-up reel hub is rotating, i.e., tape is running.
5	LVR	I	Rch input for level meter. Input level is A/D-converted in this IC and the converted result is transferred to the Display Control IC (U601) via pin 13 (DDAT).
6	LVL	I	Lch input for level meter. The function is the same as above LVR (Rch).
7	KS1	I	Record/Monitor switch input. Record switch ON: 0 V Monitor switch ON: 1.6 V
8	KS0	I	Stop/Counter Search/Counter Reset switch input. Stop switch ON: 0 V Counter Search switch ON: 1.6 V Counter Reset switch ON: 3.3 V
9	MREM	I	System remote mode signal input. "L": "Tape 1" is selected. "H": "Tape 2" is selected.
10	HD$\overline{2}$/3	I	Fixed to "H".
11	—	O	Not used.
12	$\overline{DCLK}$	O	Clock for serial data DDAT at pin 13.
13	DDAT	O	Serial data for Display Control IC (U601), which includes display data and control information.
14	DEN	O	Enable signal to Display Control IC (U601). Active "H".
15 16 17	—	I	Not used. Connected to GND.
18	$\overline{POFF}$	I	Power OFF signal input. Becomes "L" when power is turned OFF. 
19	$\overline{LMUT}$	O	Line mute signal output. Active "L".
20	$\overline{RMUT}$	O	Record mute signal output. Active "L". Record mute is released only in Record/Play mode.
21	$\overline{BIAS}$	O	Bias ON/OFF signal output. "L": Bias ON.
22 23 24	—	O	Not used. (Open).
25	$\overline{HPLY}$	O	Source signal output. Active "L".
26	$\overline{HREC}$	O	Tape signal output. Active "L".

Pin No.	Signal Name	In/ Out	Function
27	RMSP	O	Reel motor speed select signal output. Becomes "L" in play mode. 
28	—	O	Not used.
29	RMR	O	Reel motor drive control signal output. Becomes "H" in Rewind mode. 
30	RMF	O	Reel motor drive control signal output. Becomes "H" in Play or Fast Forward mode. 
31	NC	—	No connection.
32	VDD	—	Supplied with +5 V.
33	AZRD	O	Off center position indication signal of the Playback Azimuth control. Drives red LED in Rec./Play or Rec./Pause mode.
34	AZGR	O	Center position indication signal of the Playback Azimuth control. Drives Green LED in Playback mode. Mode / Center / Out of Center Play / Green / — Rec./Play, Rec./Pause / Green / Red
35	ASMR	O	Control motor reverse drive signal output. Becomes "H" when turning the control motor reverse (in the direction of Play-Pause-Stop-FF/REW). 
36	ASMF	O	Control motor forward drive signal output. Becomes "H" when turning the control motor forward (in the direction of FF/REW-Stop-Pause-Play). 
37 38	TAP B TAP A	I	Tape type select signal input. Type / TAP A / TAP B Type I / H / H Type II / L / H Type IV / H/L / L
39 40	B/$\overline{C}$ $\overline{DOLBY}$ $\overline{NR}$	I	Dolby NR mode select signal input. Mode / $\overline{DLBY}$ / B/$\overline{C}$ Dolby NR OFF / H / H/L Dolby NR B / L / H Dolby NR C / L / L
41	$\overline{MPX}$	I	MPX filter switch signal input. "L": MPX Filter ON, "H"=OFF

Pin No.	Signal Name	In/ Out	Function
42 43	TIM B TIM A	I	Repeat/Timer switch signal input. Mode / TIM A / TIM B OFF / H / H Auto Repeat / L / H Timer Play / H / L Timer Record / L / L
44	REC PRO	I	Record protect switch signal input. "H": Recording is allowed.
45	$\overline{RESET}$	I	System reset signal input. Active "L". 
46 47	X2 X1	I	4 MHz oscillator is connected.
48 49 50 51	—	O	Not used. (Open)
52	RREM	O	System remote return signal output.
53 54 55	—	O	Not used. (Open)
56	$\overline{EJC}$	I	Cassette In switch signal input. Becomes "L" while the Cassette Cover Ass'y is open.
57 58 59	CAM2 CAM1 CAM0	I	Cam switch signal input. Mode of the mechanism can be sensed according to states of CAM0, CAM1 and CAM2.
60	$\overline{KFF}$	I	FF switch signal input. "L" when pressed.
61	$\overline{KREW}$	I	REW switch signal input. "L" when pressed.
62	$\overline{KPUS}$	I	Pause switch signal input. "L" when pressed.
63	$\overline{KPLY}$	I	Play switch signal input. "L" when pressed.
64	VSS	—	Grounded.



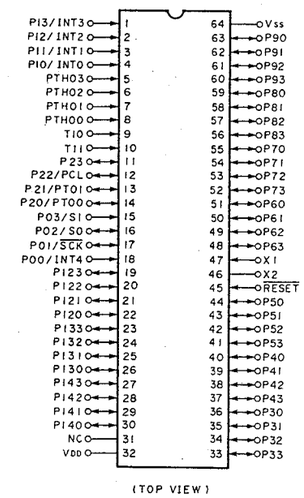
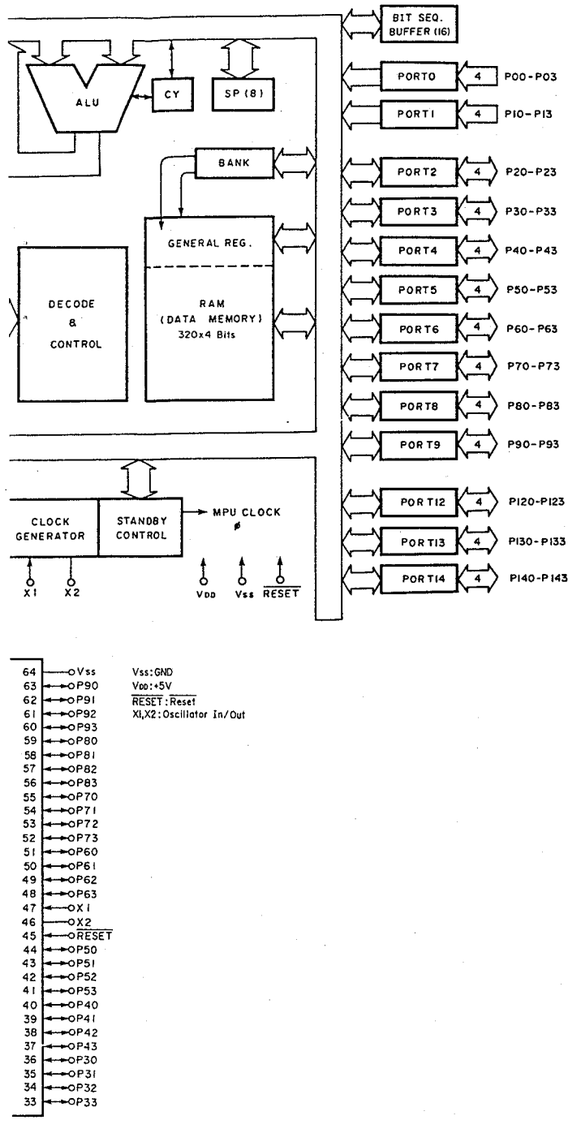


Fig. 9.1.4 Microprocessing Unit (MPU) μ



ssing Unit (MPU) μPD75106CW

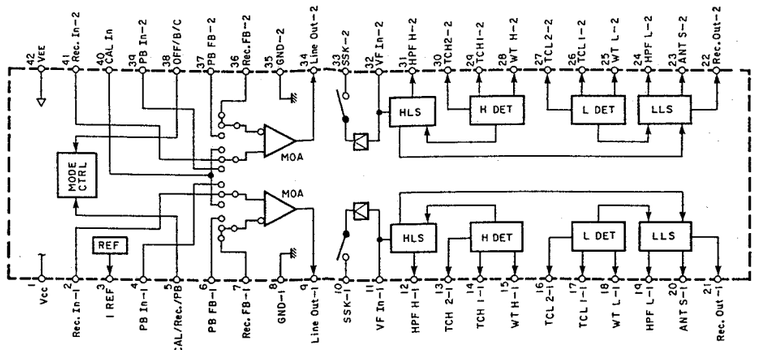


Fig. 9.1.5 Dolby NR IC CX20188

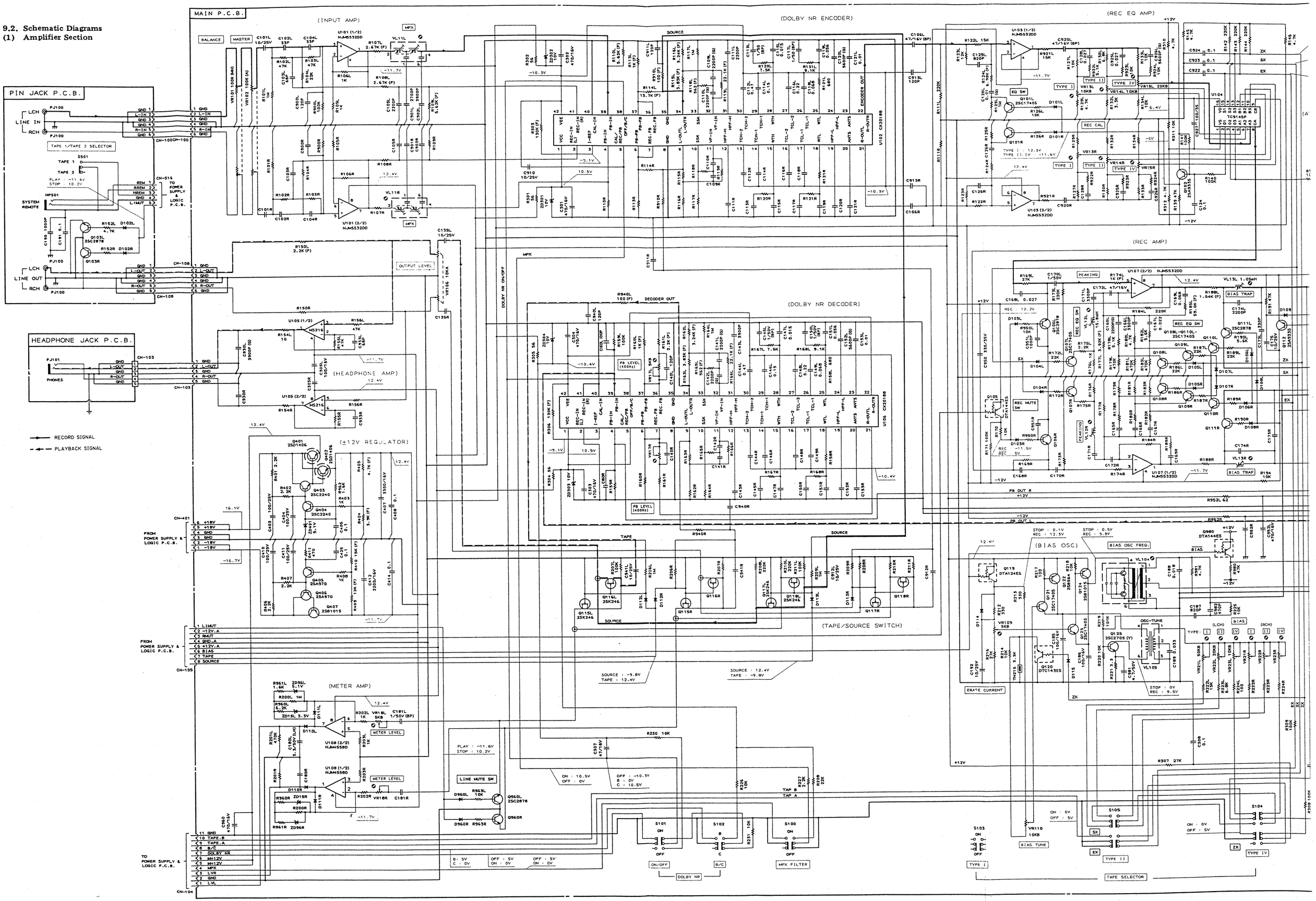
U102/U106 CX20188 (Dolby NR IC)

Pin No.	Signal Name	Function
1	Vcc	Positive power supply input terminal.
2,41	Rec. In	Record signal input terminal.
3	I Ref.	Reference current input terminal.
4,39	PB In	PB signal input terminal.
5	CAL/Rec./PB	Calibration/Recording/Playback select terminal.
6,37	PB FB	Playback signal feedback terminal.
7,36	Rec. FB	Record signal feedback terminal.
8,35	GND	GND terminal.
9,34	Line Out	Line signal (decoded signal) output terminal.
10,33	SSK	Spectral skewing switch terminal.
11,32	VF In	Encode circuit input terminal.
12,31	HPF H	HLS high-pass filter terminal.
13,30	TCH 2	HLS detector time constant determination terminal 2.
14,29	TCH 1	HLS detector time constant determination terminal 1.
15,28	WT H	HLS weighting terminal.
16,27	TCL 2	LLS detector time constant determination terminal 2.
17,26	TCL 1	LLS detector time constant determination terminal 1.
18,25	WT L	LLS weighting terminal.
19,24	HPF L	LLS high-pass filter terminal.
20,23	ANT S	Anti-saturation terminal.
21,22	Rec. Out	Record signal (encoded signal) output terminal.
38	OFF/B/C	Dolby NR OFF/B-type/C-type select terminal.
40	CAL In	Calibration input terminal. Not used.
42	V_{EE}	Negative power supply input terminal.

U601 MSC7112 (Display Controller)

Pin No.	Signal Name	In/ Out	Function
1 2	OSC1 OSC0	I O	An RC circuit is connected for making an oscillation circuit.
3	$\overline{POR}$	I	Reset signal input at power ON. The IC is reset when "L".
4	VDD	—	Supplied with +5 V.
5 to 16	D1 to D12	O	FL tube grid drive output. (D8—D12 are not used.)
17 to 21	LED1 to LED5	O	Not used. (Open)
22	VSS	—	Grounded.
23	VEE	—	Supplied with approx. —25 V.
24 to 39	SEG P to SEG A	O	FL tube anode drive output. Active "H". (SEGP — SEGN are not used.)
40	SCLK	I	Shift clock input for internal shift register. Shifts the data at pin 41 (DATAIN) at every rising edge.
41	DATAIN	I	Control & display serial data sent from the mechanism control MPU (U501). MSB first.
42	LOAD	I	Data latch pulse. The data is latched to the internal register at the falling edge.

9.2. Schematic Diagrams
(1) Amplifier Section



LOGIC P.C.B.

MECHANISM ASS'Y

SHUT-OFF P.C.B

MODE	CAM 0	CAM 1	CAM 2
STOP	ON	ON	OFF
PLAY	ON	OFF	ON
PAUSE	OFF	ON	ON
REC	ON	OFF	ON
FF	ON	OFF	OFF
REW	ON	OFF	OFF

ON : L OFF : H

TIMER SWITCH P.C.B.

MODE	TIM A	TIM B
OFF	H	H
AUTO REPEAT	L	H
TIMER PLAY	H	L
TIMER REC	L	L

CONTROL SWITCH & DISPLAY P.C.B.

(MOTOR DRIVER)

(MECHANISM CONTROL MPU)

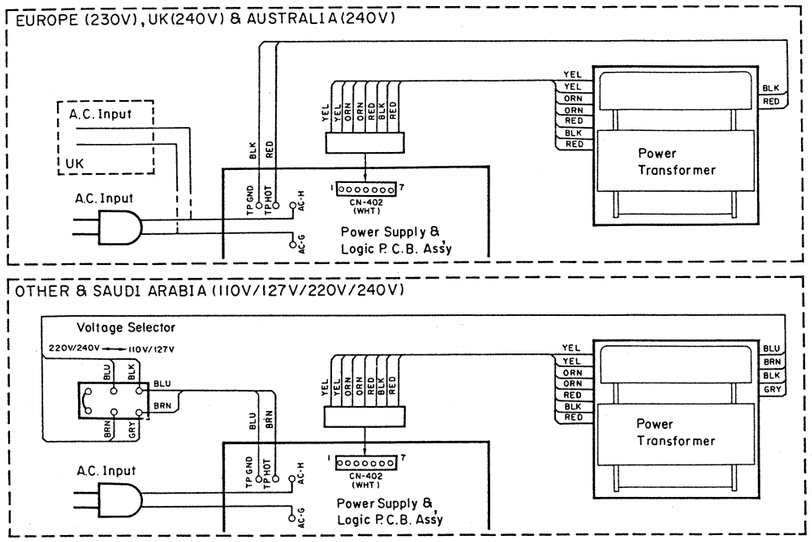
(FL DRIVER)

PLAYBACK AZIMUTH

REC MUTE

Fig. 9.2.2

10. WIRING DIAGRAM



Notes: 1. Table of wire colors

BRN — Brown	BLU — Blue
RED — Red	VIO — Violet
ORN — Orange	GRY — Gray
YEL — Yellow	WHT — White
GRN — Green	BLK — Black

2. Component side view of the P.C.B. is illustrated unless otherwise specified.
3. Wire tube color is shown in ( ).

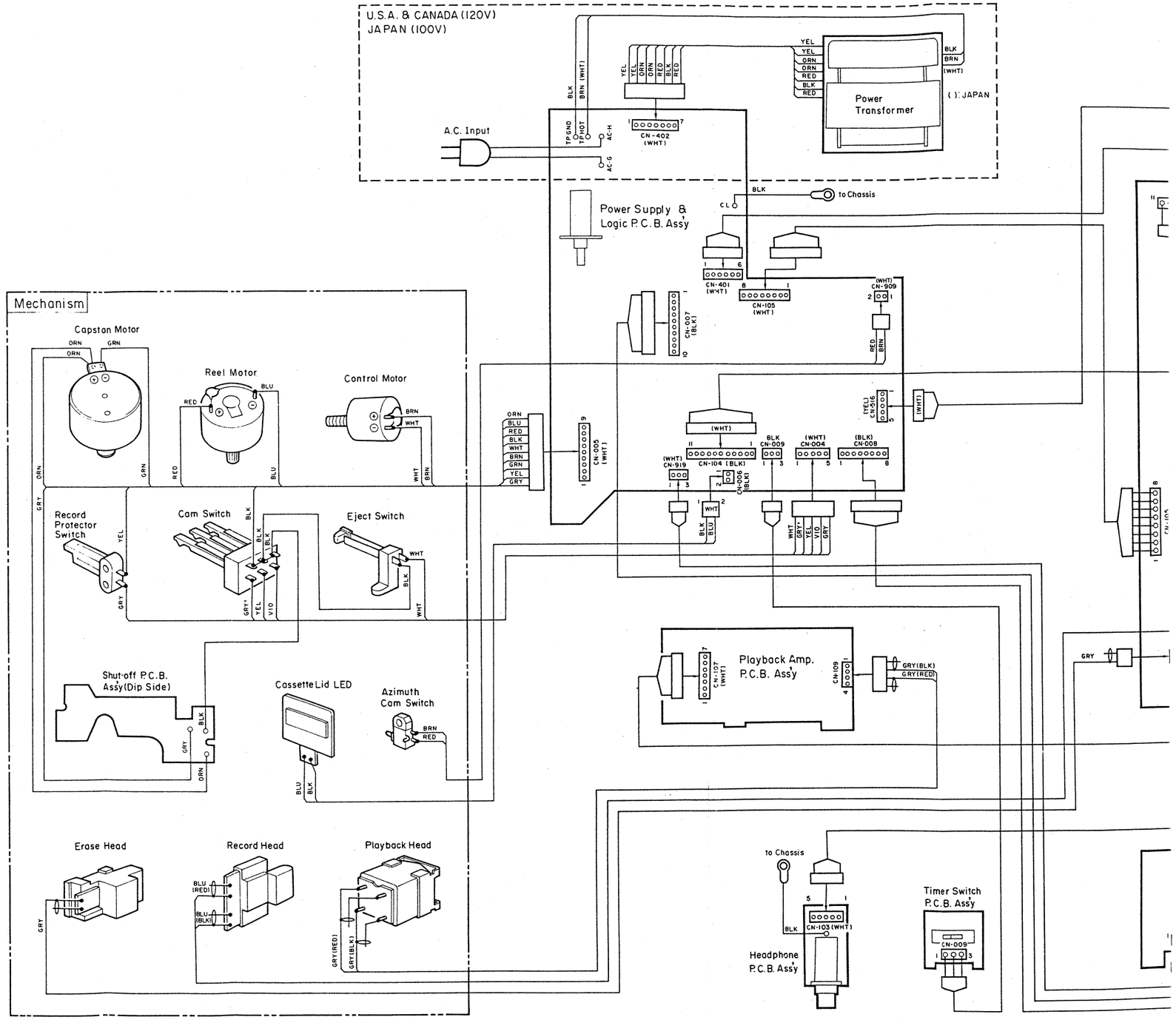
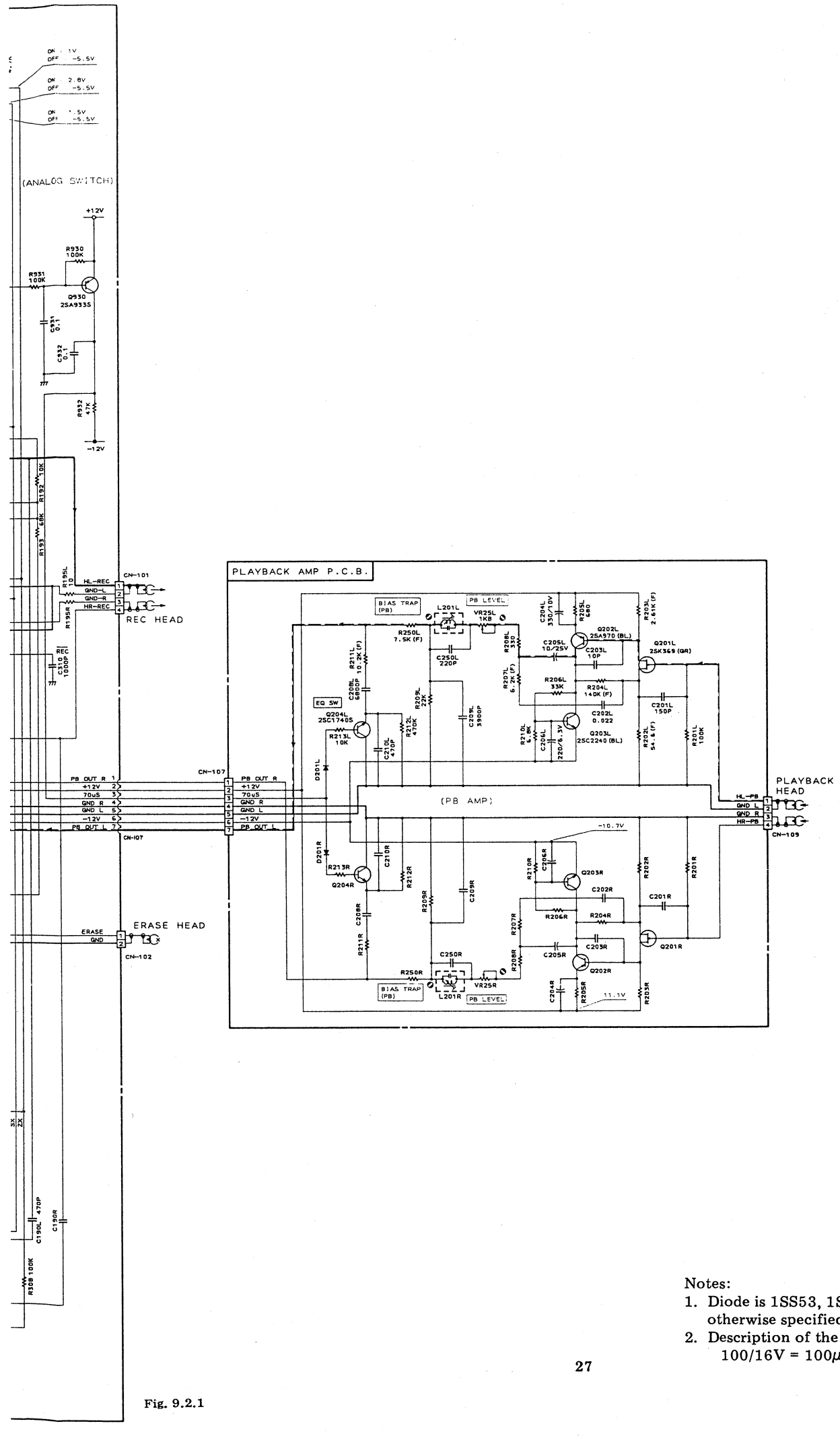
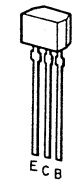
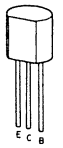


Fig. 10

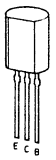




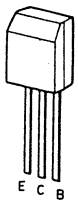
2SA933S
2SC1740S
DTA114ES
DTA124ES
DTA144ES
DTC143ES
DTC144ES



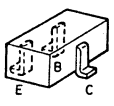
2SA970
2SA1020
2SC2240
2SC2878



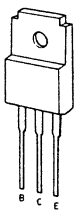
2SC2705



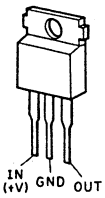
2SB564



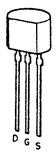
2SC2812



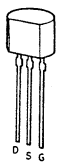
2SB1015
2SD1406



7805



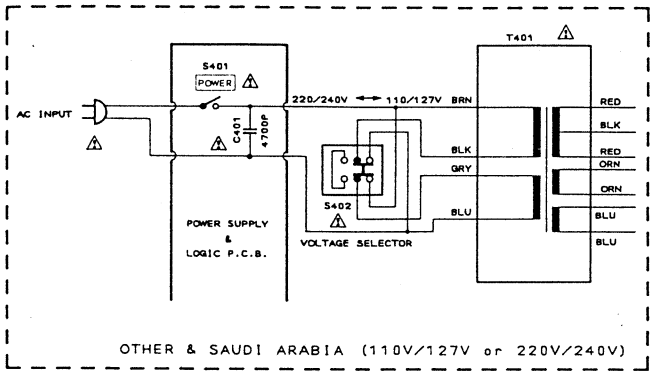
2SK246

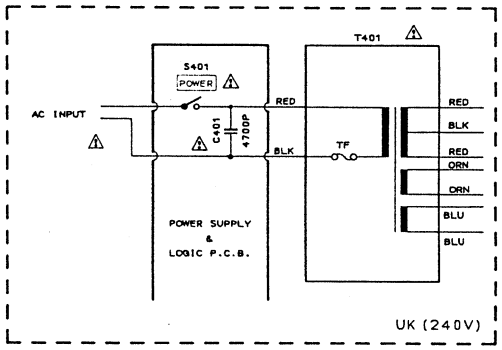


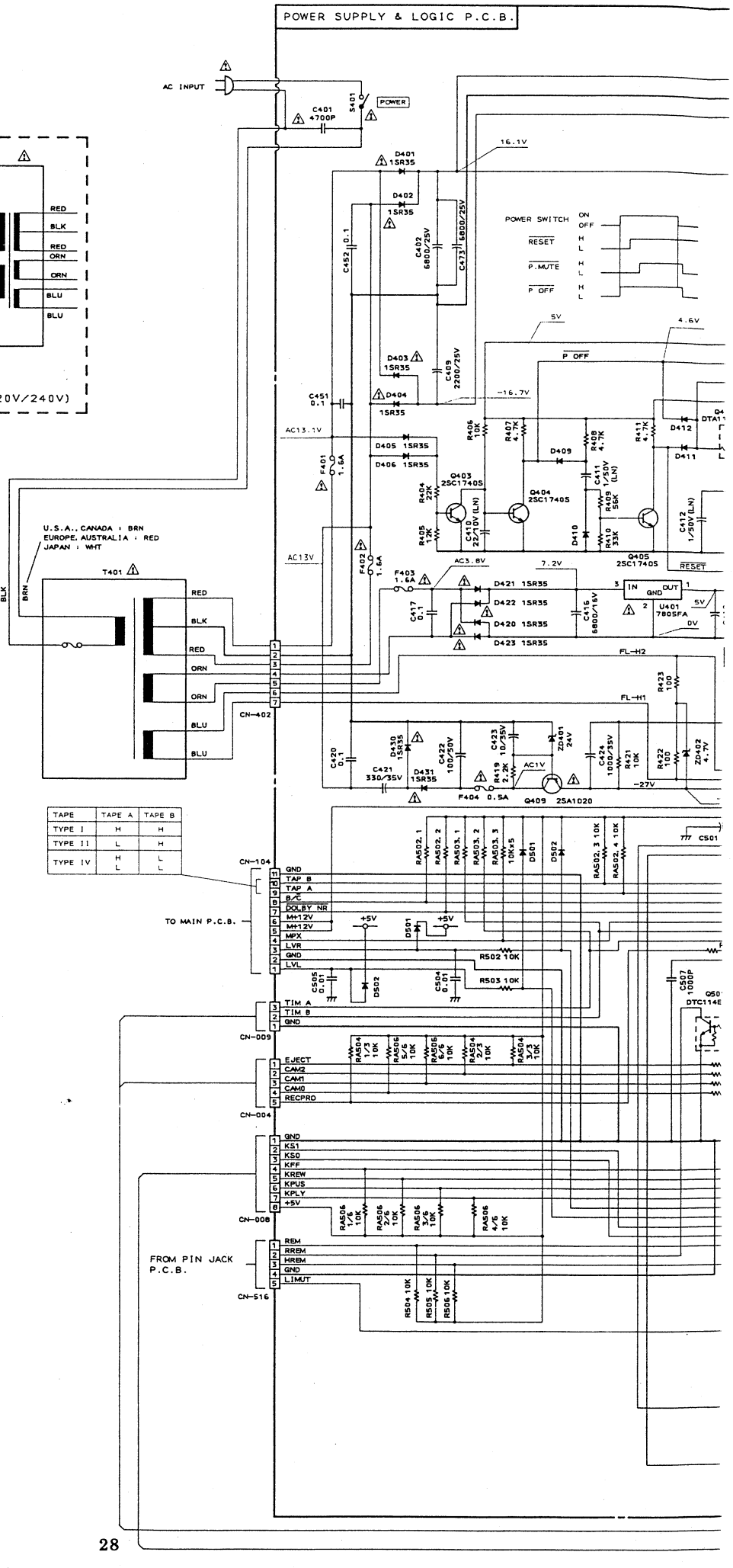
2SK369

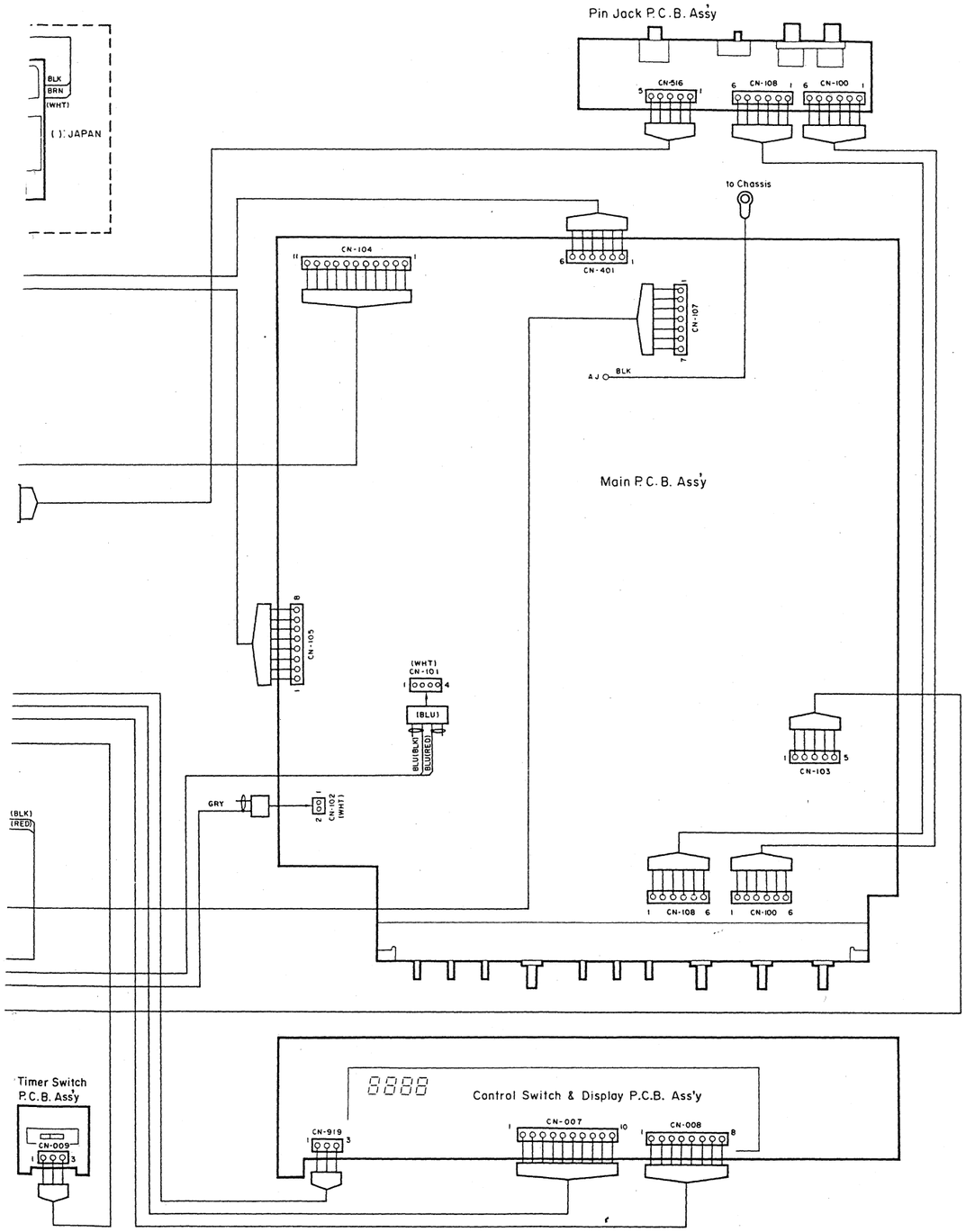
Notes:
1. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
2. Description of the electrolytic capacitor: 100/16V = 100μ 16V

Fig. 9.2.1


S401
POWER
AC INPUT
C401
4700P
220/240V
110/127V
BRN
T401
RED
BLK
GRY
ORN
BLU
S402
VOLTAGE SELECTOR
POWER SUPPLY
&
LOGIC P.C.B.
OTHER & SAUDI ARABIA (110V/127V or 220V/240V)


S401
POWER
AC INPUT
C401
4700P
T401
RED
BLK
TF
ORN
BLU
POWER SUPPLY
&
LOGIC P.C.B.
UK (240V)


POWER SUPPLY & LOGIC P.C.B.
AC INPUT
C401 4700P
S401
POWER
D401 1SR35
D402 1SR35
D403 1SR35
D404 1SR35
16.1V
POWER SWITCH
ON
OFF
RESET
P.MUTE
P OFF
5V
4.6V
-16.7V
AC13.1V
AC13V
AC3.8V
7.2V
D405 1SR35
D406 1SR35
D409
D410
D411
D412
Q403 2SC1740S
Q404 2SC1740S
Q405 2SC1740S
U.S.A., CANADA : BRN
EUROPE, AUSTRALIA : RED
JAPAN : WHT
T401
CN-402
D421 1SR35
D422 1SR35
D420 1SR35
D423 1SR35
U401 7805FA
FL-H2
FL-H1
AC1V
-27V
Q409 2SA1020
F404 0.5A
TAPE
TAPE A
TAPE B
TYPE I
TYPE II
TYPE IV
CN-104
TO MAIN P.C.B.
GND
TAP B
TAP A
B/C
DOLBY NR
M+12V
M-12V
MPX
LVR
GND
LVL
R502 10K
R503 10K
CN-009
TIM A
TIM B
GND
CN-004
EJECT
CAM2
CAM1
CAM0
RECPRO
CN-008
GND
KS1
KS0
KFF
KREW
KPUS
KPLY
+5V
CN-516
FROM PIN JACK P.C.B.
REM
RREM
HREM
GND
LIMIT
R504 10K
R505 10K
R506 10K



11. BLOCK DIAGRAMS

11.1. Amplifier Section

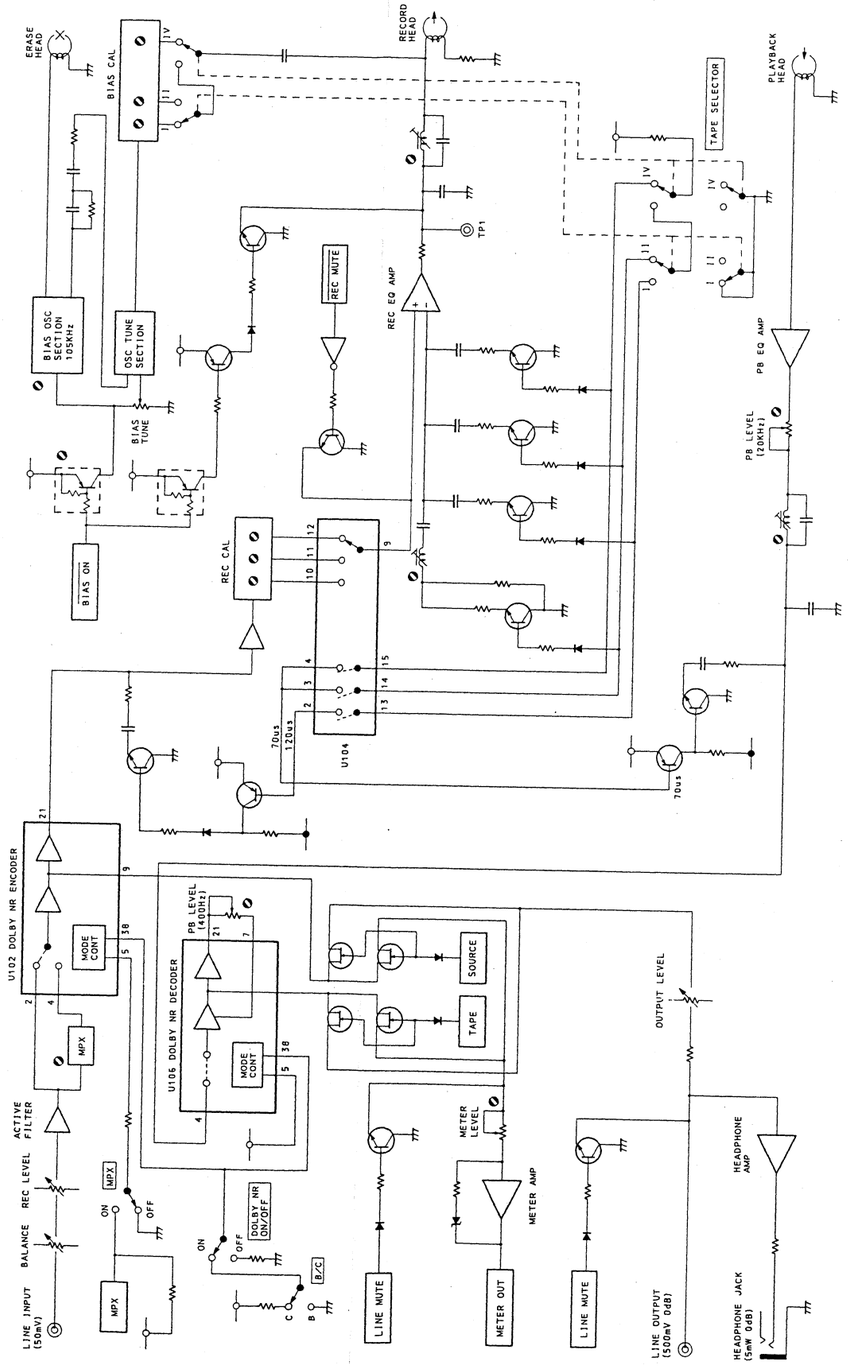


Fig. 11.1

11.2. Mechanism Control Section

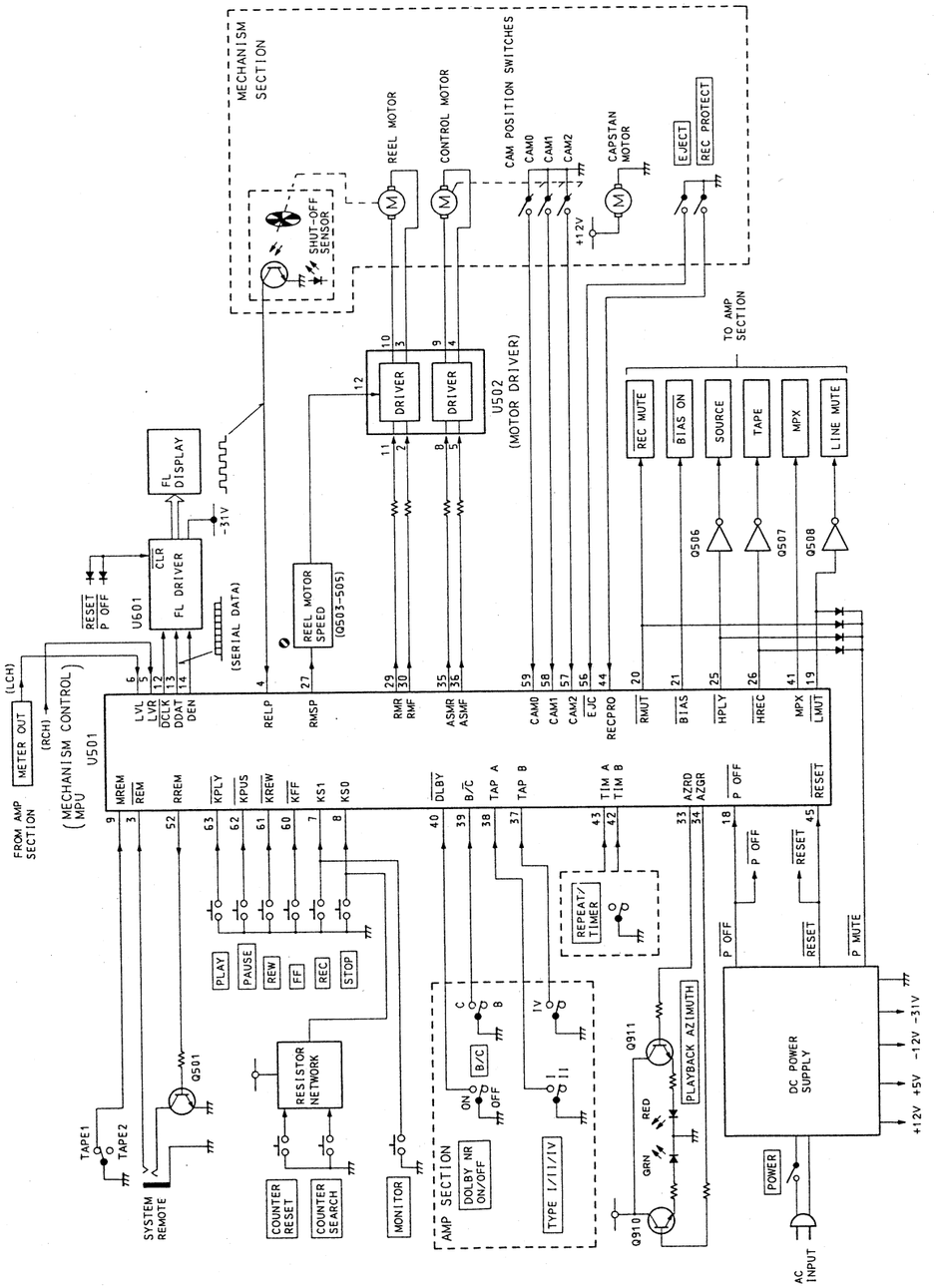


Fig. 11.2

12. TIMING CHARTS AND EQ. AMP. FREQUENCY RESPONSE

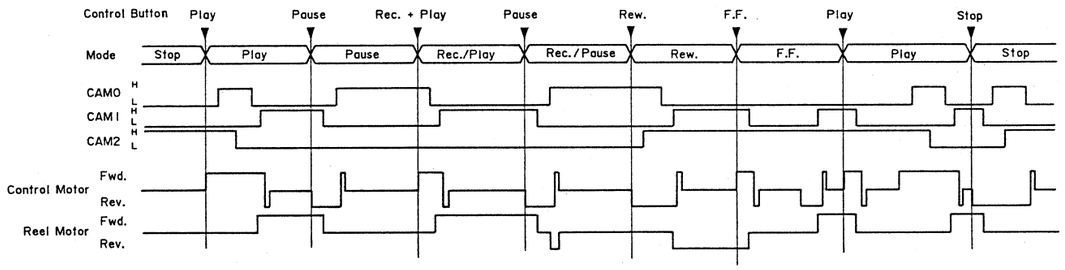
12.1. Timing Charts

(1) Overall Timing Chart

Mode	Playback			Record		
	Stop	Play	Stop	Rec./Pause	Rec./Play	Stop
Reel Motor						
Line Mute						
Bias						
Rec. Mute						

Fig. 12.1.1

(2) Mechanism Control Timing Chart



CAM0/1/2(Cam Position Switch Contacts): L=ON(Make), H=OFF(Break)
Control Motor Direction : Fwd.=F.F./Rew.→Stop→Pause→Play
Rev.=Play→Pause→Stop→F.F./Rew.
Reel Motor Direction : Fwd.=Play or F.F.
Rev.=Rew.

Fig. 12.1.2

. Eq. Amp. Frequency Response
Playback Frequency Response

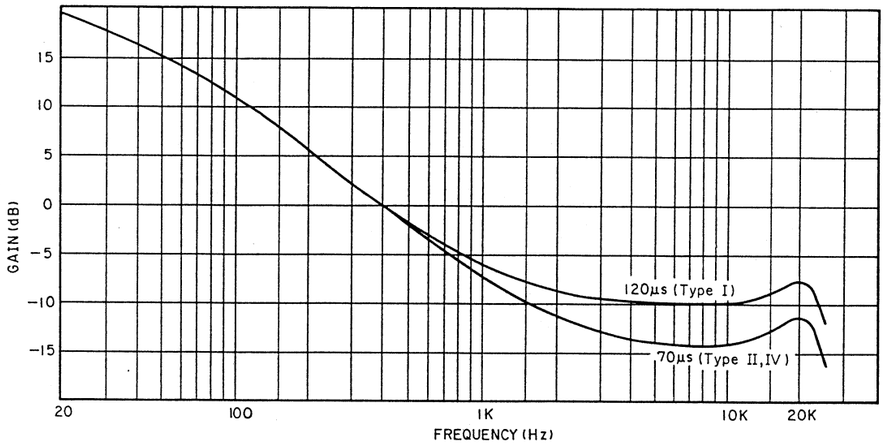


Fig. 12.2.1

Record Current Frequency Response

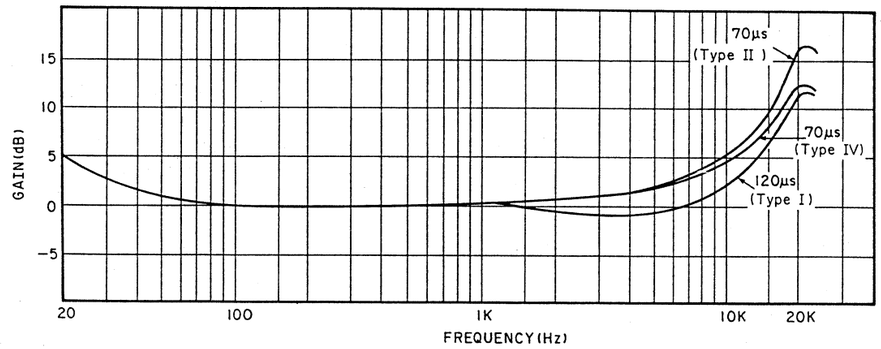


Fig. 12.2.2

13. SPECIFICATIONS

Track Configuration	4 tracks/2-channel stereo
Heads	3 (erase head x 1, record head x 1, playback head x 1)
Motors	
<Tape Transport>	DC servo motor (capstan drive) x 1 DC motor (reel drive) x 1
<Mechanism>	DC motor (cam drive) x 1
Wow and Flutter	Less than ±0.06% WTD Peak Less than 0.035% WTD RMS
Tape Speed	1-7/8 ips. (4.8 cm/sec.) ±0.5%
Fast-Wind Time	Approx. 95 seconds (with C-60 cassette)
Frequency Response	20—21,000 Hz ±3 dB (recording level —20 dB, Type I/II/IV)
Signal to Noise Ratio	
Dolby C-Type NR On <70 μs, Type IV>	Better than 72 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Dolby B-Type NR On <70 μs, Type IV>	Better than 66 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion	Less than 0.8% (400 Hz, 0 dB, Type I/IV) Less than 1.0% (400 Hz, 0 dB, Type II)
Channel Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Erasure	Better than 60 dB (100 Hz, +10 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV/40 kΩ
Output	
Line	0.5 V/2.2 kΩ (400 Hz, 0 dB, output level control at max.)
Headphones	5.0 mW/8 Ω (400 Hz, 0 dB, output level control at max.)
Power Source	120, 230, 240 V or 110—127/220—240 VAC, 50/60 Hz
Power Consumption	25 W max.
Dimensions*	430 (W) x 100 (H) x 320 (D) mm 16-15/16 (W) x 3-15/16 (H) x 12-5/8 (D) inches
Approximate Weight	5.4 kg/11 lbs. 14 oz.

*: Dimensions do not include protruding parts. Height is the panel height.

- Specifications and Design are subject to change for further improvement without nptice.
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